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EDISON ELECTRIC INSTITUTE BULLETIN

MAY, 1936

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EDISON ELECTRIC INSTITUTE

STATISTICAL DATA OF THE ELECTRIC LIGHT AND POWER INDUSTRY

Compiled Monthly by the Edison Electric Institute—Covers 100% of the Industry

DURING THE MONTH OF MARCH (Preliminary)

	1936	1935	%
Kilowatt-hours Generated* (Net)			
By Fuel	4,843,259,000	4;129,438,000	+17.3
By Water Power	3,447,088,000	3,290,144,000	+ 4.8
Total Kilowatt-hours Generated	8,290,347,000	7,419,582,000	+11.7
Additions to Supply			
Energy Purchased from Other Sources	174,203,000	182,625,000	− 4.6
Net International Imports	82,273,000	69,889,000	+17.7
Total	256,476,000	252,514,000	+ 1.6
Deductions from Supply			
Energy Used in Electric Railway Departments	52,792,000	52,729,000	+ 0.1
Energy Used in Electric and Other Departments	118,538,000	118,801,000	− 0.2
Total	171,330,000	171,530,000	− 0.1
Total Energy for Distribution	**8,375,493,000**	**7,500,566,000**	**+11.7**
Energy Lost in Transmission, Distribution, Etc.	**1,462,458,000**	**1,419,366,000**	**+ 3.0**
Kilowatt-hours Sold to Ultimate Consumers	**6,913,035,000**	**6,081,200,000**	**+13.7**
Sales to Ultimate Consumers (kw-hrs)			
Domestic Service	1,253,769,000	1,125,198,000	+11.4
Commercial—Small Light and Power (Retail)	1,255,899,000	1,120,059,000	+12.1
Commercial—Large Light and Power (Wholesale)	3,648,576,000	3,133,781,000	+16.4
Municipal Street Lighting	209,448,000	200,845,000	+ 4.3
Railroads—Street and Interurban	393,720,000	384,253,000	+ 2.5
Railroads—Electrified Steam	83,098,000	66,840,000	+24.3
Municipal and Miscellaneous	68,525,000	50,224,000	+36.4
Total Sales to Ultimate Consumers	6,913,035,000	6,081,200,000	+13.7
Total Revenue from Ultimate Consumers	$165,650,200	$155,884,400	+ 6.3

DURING TWELVE MONTHS ENDING MARCH 31st

Kilowatt-hours Generated* (Net)			
By Fuel	58,591,407,000	53,258,015,000	+10.0
By Water Power	36,521,840,000	32,699,846,000	+11.7
Total Kilowatt-hours Generated	95,113,247,000	85,957,861,000	+10.7
Purchased Energy (net)	3,005,254,000	2,969,347,000	+ 1.2
Energy Used in Electric Railway and Other Departments	1,944,320,000	1,989,256,000	− 2.3
Total Energy for Distribution	**96,174,181,000**	**86,937,952,000**	**+10.6**
Energy Lost in Transmission, Distribution, Etc.	**16,172,828,000**	**14,885,058,000**	**+ 8.7**
Kilowatt-hours Sold to Ultimate Consumers	**80,001,353,000**	**72,052,894,000**	**+11.0**
Total Revenue from Ultimate Consumers	**$1,948,631,700**	**$1,858,818,800**	**+ 4.8**
Important Factors			
Percent of Energy Generated by Waterpower	38.4%	38.0%	
Domestic Service (Residential Use)			
Average Annual Consumption per Customer (kw-hr)	688	639	+ 7.7
Average Revenue per kw-hr (Cents)	4.93¢	5.25¢	− 6.1
Average Monthly Bill per Domestic Customer	$2.83	$2.80	+ 1.1

BASIC INFORMATION AS OF MARCH 31st

Generating Capacity (kw)—Steam	23,990,800	23,769,800	
—Waterpower	9,007,900	8,952,500	
—Internal Combustion	497,400	500,500	
Total Generating Capacity in Kilowatts	33,496,100	33,222,800	
Number of Customers			
Farms in Eastern Area (Included with Domestic)	(582,468)	(534,907)	
Farms in Western Area (Included with Commercial—Large)	(217,784)	(211,027)	
Domestic Service	21,115,849	20,535,169	
Commercial—Small Light and Power	3,740,755	3,735,035	
Commercial—Large Light and Power	487,689	497,516	
Other Ultimate Consumers	65,232	71,265	
Total Ultimate Consumers	25,409,525	24,838,985	

* By courtesy of the U. S. Geological Survey with deductions for certain plants not considered Electric Light and Power Enterprises.

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EDISON ELECTRIC INSTITUTE BULLETIN

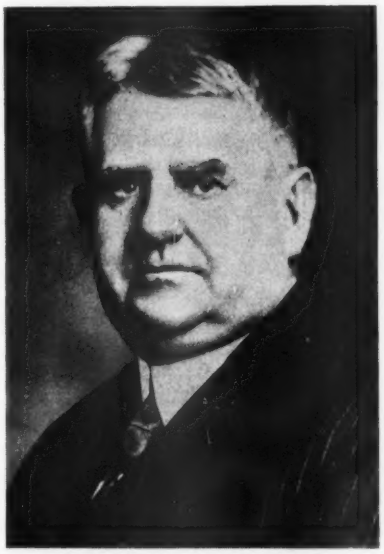
Volume IV MAY, 1936 No. 5

The Convention Program

St. Louis Ready to Welcome Delegates to the Institute's Fourth Annual Meeting

THE most diversified and inclusive program that the electric light and power industry has presented at any meeting in recent years is scheduled for the Fourth Annual Convention of the Institute to be held at St. Louis in the new Municipal Auditorium, June 1st to 4th inclusive.

This meeting is also expected to be the best attended of any Convention since the Institute was organized. Every effort is being made to make it both interesting and profitable to the delegates. Mr. Egan, President of the Union Electric Light and Power Company, the host company to the Convention, has extended a welcome to the delegates in behalf of his organization and the people of St. Louis. He writes that "this business of ours has taken on a new and increased complexity, our problems became more national in scope, and the necessity for a broad understanding of intricate national questions increases every day. Thus the Convention becomes more essential than ever, not only for the member companies, but likewise for the public they serve. To the Convention delegates we extend a hearty welcome. It is our hope that your visit will be both profitable and pleasant, and we will be happy to devote ourselves to making it so."



PRESIDENT McCARTER

Outstanding speakers will talk on such important and timely subjects as the various aspects of utility accounting, the cost of electric service, the trend of rate reductions, the present aspects of utility financing, firm ratings as a guide to system loading and design, public relations, the employees' attitude in the present era, farm electrification, the outlook for the electric power industry, governmental intimidation and encroachment in the field of business.

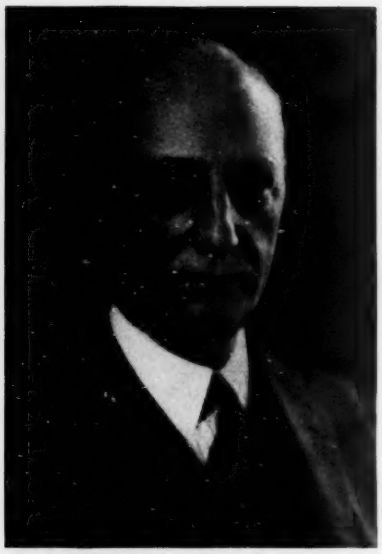
A considerable part of the program will be devoted to the sales efforts of the industry, with particular attention to the National Sales Programs promoted cooperatively by the Institute.

Guest speakers at the Convention include Harper Sibley, President, Chamber of Commerce of the United States; Philip Cabot, Professor of Business Administration, Harvard University; Lewis H. Carris, Managing Director, National Society for the Prevention of Blindness; and Dr. E. A. White, Committee on Relation of Electricity to Agriculture.

Those prominent in the electric industry who will speak include Thomas N. McCarter, President of the Institute; Louis H. Egan, President, Union Electric Light and Power Company, St. Louis; C. W. Kellogg, Chairman of the Board, Engineers Public Service Company, New York; Frank W. Smith, President, Consolidated Edison Company, New York; Frank T. Post, President, The Washington Water Power Company, Spokane, Wash.

J. F. Owens, President Okla-

New Municipal Auditorium on a Rainy Night



FRANK W. SMITH

LOUIS H. EGAN

FRANK T. POST

homa Gas and Electric Company, Oklahoma City, Okla.; W. W. Freeman, Vice-President, Columbia Gas and Electric Corporation, New York; Norman R. Gibson, Vice-President, Buffalo Niagara and Eastern Power Corporation, Buffalo; W. G. Vincent, Vice-President, Pacific Gas and Electric Co., San Francisco; L. R. Nash, Vice-President, Stone & Webster Engineering Corporation, New York, N. Y.

George E. Whitwell, Vice-President, Philadelphia Electric Company, Philadelphia; C. E. Michel, Vice-President, Union Electric Light and Power Co., St. Louis; Dr. Adam S. Bennion, Assistant to President, Utah Power and Light Company, Salt Lake City; H. B. Gear, Vice-President in Charge of Operating and Engineering, Commonwealth Edison Company, Chicago; H. L. Gruehn, Assistant Treasurer, Consolidated Gas, Electric Light and Power Company, Baltimore, Md.; C. E. Kohlhepp, Vice-President, Wisconsin Public Service Corporation, Milwaukee; W. H. Swinney, Controller, West Penn Power Company, Pittsburgh, Pa.; S. M. Dean, The Detroit Edison Company, Detroit; E. A. Brand, Niagara Hudson Power Corporation, Buffalo, N. Y.; R. H. Tillman, Consolidated Gas, Electric Light & Power Company, Baltimore; G. W. Moore, Texas Power & Light Co., Dallas; A. E. Silver, Ebasco Service, Inc., New York; C. E. Greenwood, Commercial Director, Edison Electric Institute, New York, and Dr. G. W. Allison, Field Representative, E.E.I.

The five business sessions will be held in the air-conditioned Opera House of the Municipal Auditorium. The first will begin at 2:30 Monday afternoon, June 1st; the second Tuesday morning, June 2nd, at 9:30; the third Wednesday morning, June 3rd, at 9:30; the fourth Wednesday afternoon at 2:30. The final session will be held Thursday morning, June 4th, at 9:30.

The registration desk in the Grand Lounge of the Municipal Auditorium will open at 11 a.m., Monday morning, June 1st.

Special meetings of several of the Committees will be held on Tuesday afternoon, the Operating Committee will meet Tuesday noon and the Board of Trustees Wednesday noon. Except for the committee and board meetings, all of the sessions will be open to those wishing to attend. Members of the Committees that will hold meetings will be notified by letter.

J. F. OWENS

THE PROGRAM

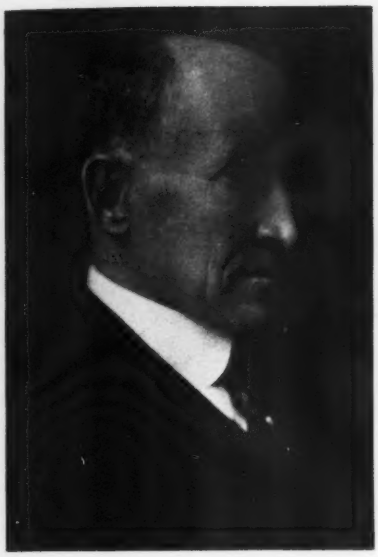
First General Session

With President McCarter presiding, the first general session will begin promptly at 2:30 Monday afternoon, June 1st. Mr. Louis H. Egan, President of the Union Gas and Electric Company of St. Louis, will deliver the welcoming address.

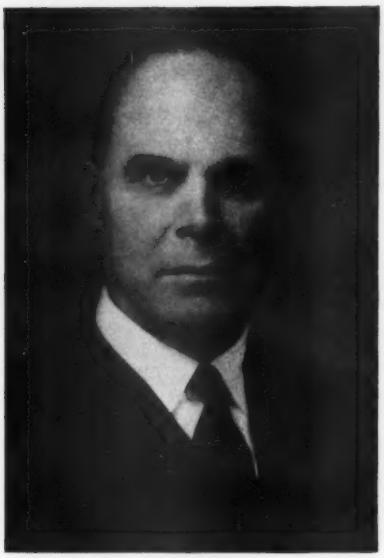
This session will be devoted largely to the economics of the industry. Mr. Norman R. Gibson, Vice-President and Chief Engineer for the Buffalo Niagara and Eastern Power Corporation, will have as his subject "The Cost of Electric Service." Mr. W. G. Vincent, Vice-President and Executive Engineer of the Pacific Gas and Electric Company, will follow Mr. Gibson with a history and valuable comment on Rate Reductions in the industry.

With at least two regulatory groups promulgating radically new set-ups in the Classification of Accounts for electrical utilities, a symposium on utility accounting becomes of particular value at this time. Mr. L. R. Nash, Vice-President, Stone & Webster Engineering Corporation, will lead the symposium with a discourse on the "Fundamentals of Accounting."

Mr. H. L. Gruehn, Consolidated Gas, Electric Light and Power Company of Baltimore, will have "Aboriginal Cost"



PHILIP CABOT



C. W. KELLOGG

HARPER SIBLEY

as his theme; Mr. H. B. Gear, Vice-President, Commonwealth Edison Company, will discuss "Continuous Inventories"; Mr. C. E. Kohlhepp, Wisconsin Public Service Corporation, will speak on the "Cost and Economic Value of Accounting Elaborations"; and Mr. W. H. Swinney, West Penn Power Company, will take the field of "Merchandising Accounting" as his subject.

Second General Session

This session will begin at 9:30 Tuesday morning, June 2nd. Features of this Session will be the presidential address by Mr. McCarter, and addresses by Mr. J. F. Owens, President, Oklahoma Gas and Electric Company; Mr. Harper Sibley, President of the Chamber of Commerce of the United States, and Mr. George E. Whitwell, Vice-President of the Philadelphia Electric Company.

The eagerness with which the Electric Kitchen Modernization movement has been welcomed by both the utilities and the manufacturers, as well as the receptiveness of the public, warrants a thorough discussion at the Convention. Mr. Whitwell, leader in this as well as other National Sales Programs, has been selected as the speaker to do this subject justice. The formal title to his address is both descriptive and an injunction to action, "Modernize: Electrify Your Kitchen."

Mr. McCarter has not divulged the main topic of his address, but it can be anticipated that it will include a survey of the work of the Institute during his administration and range through pungent observations on the times, manners and men, to sagacious recommendations for the welfare of the industry.

Mr. Owens has been given a free-hand on the choice of a subject. Whatever it is, it will be a forceful presentation.

Mr. Sibley, from the vantage ground of the presidency of the U. S. Chamber of Commerce and his distinguished accomplishments in agriculture, social work, law, industry and finance, will survey "American Enterprise" in his address. After all, there are still believers in and practitioners of this distinctive type of effort.

L. R. NASH

Third General Session

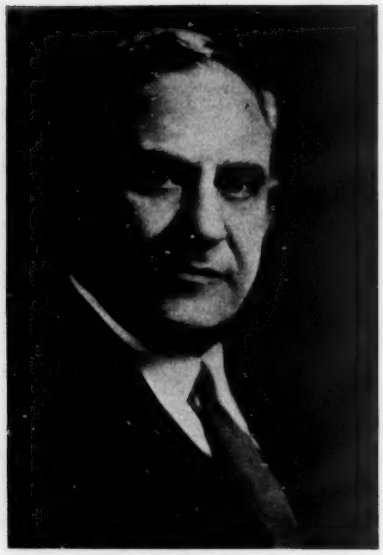
The third session begins Wednesday morning, June 3rd, at 9:30 with a paper by Mr. S. M. Dean, Detroit Edison Company, on "Firm Ratings as a Guide to System Loading and Design." Mr. Dean is followed by Mr. C. W. Kellogg, Chairman, Engineers Public Service Company, who will discuss the "Present Aspects of Utility Financing."

Many wild statements and under- and over-drawn pictures regarding the status of farm electrification have been broadcast during recent months to the disadvantage of the industry and to the misleading of farm people. The clarification of this subject will take up the balance of this session. Mr. W. W. Freeman, Columbia Gas and Electric Corporation, and Chairman of a special utility committee on farm electrification, will talk on the "Relations of the Industry and the Rural Electrification Administration."

Dr. E. A. White, of the C.R.E.A., will speak on "Using Electricity on the Farm"; Mr. E. A. Brand, Niagara Hudson Power Corporation, will discuss "New Developments in Farm Wiring"; and Mr. A. E. Silver, Consulting Engineer, Ebasco Services, Inc., will talk on "Developments in Farm Lines."

Fourth General Session

This session, to be devoted chiefly to sales problems, begins at 2:30 Wednesday afternoon, June 3rd, with a talk by Dr. G. W. Allison, Field Representative of the Institute. Dr. Allison's theme will be "National Sales Programs Create



C. E. MICHEL

W. W. FREEMAN

GEORGE E. WHITWELL

Better Understanding." The exception to the purely commercial flavor of this session will be an address by Mr. Frank T. Post, President of The Washington Water Power Company. Mr. Post has been outstanding in his conception of, and courageous in upholding, the rights of utility corporations. The subject of his address is "The Campaign to Destroy."

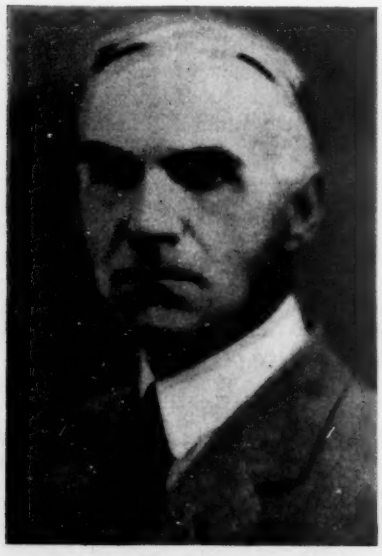
Following Mr. Post, Mr. Lewis H. Carris, Managing Director of the National Society for the Prevention of Blindness, will devote his time to the discussion of "A National Program for Prevention of Blindness and Conserving Eyesight."

A symposium on air conditioning will be led by Mr. C. E. Michel, Vice-President, Union Electric Light and Power Company. Mr. Michel will be on home grounds with this subject, both as regards locality and his pioneering efforts in this field. The title of his address will be "A Review of the Utilities' Position in the Air Conditioning Field." Discussion of "Room Cooling with Portable Units" will be made by Mr. R. H. Tillman, Consolidated Gas, Electric Light & Power Co. of Baltimore. Mr. W. G. Moore of the Texas Power & Light Company, Dallas, will discuss "House Ventilation Through the Attic."

This session will be closed with a review of "Three Decades of Utility Sales Development," by Mr. C. E. Greenwood, Commercial Director of the Institute. It is expected that Mr. Greenwood will not confine himself entirely to a review of past activities, commercial men being what they are.

Fifth General Session

No single factor so influences the success or failure of a utility organization as does the character, attitude and training of its employees. The Fifth General Session will begin at 9:30 Thursday morning with an address entitled "How Can They Know?", to be given by Dr. Adam S. Bennion, Assistant to the



N. R. GIBSON

S. M. DEAN

W. G. VINCENT

A. E. SILVER

ADAM S. BENNION

E. A. BRAND

President of the Utah Power and Light Company, Salt Lake City. Dr. Bennion's career has been devoted chiefly to problems of education, personnel and public relations. He was Professor of Education at the University of Utah and Brigham Young University before becoming Director of Personnel for the Utah Company in 1928.

Philip Cabot, Professor of Business Administration at Harvard University, has a distinguished record both as a Director of Public Utilities and later as Professor of Public Utility Management. His writings and lectures on the public utilities are widely known and respected. His subject at this session will be "The Outlook for the Electric Power Industry."

Mr. Frank W. Smith, Chairman of the Prize Awards Committee of the Institute, President of the New York Edison Company, and the affiliated gas and electric companies of New York City, will make the annual presentation of the prizes administered through the Institute. These include the Charles A. Coffin Award; the H. M. Byllesby Prizes; the B. C. Forbes Prize; the A. L. Lindemann Prizes; the Thomas W. Martin Award; Augustus D. Curtis Award; the James H. McGraw Prizes, and the George A. Hughes Award.

The session will close with the announcement of the new officers, and the handling of such business affairs as may come before the Convention.

GENERAL INFORMATION ON THE FOURTH ANNUAL CONVENTION

THE convention headquarters will be located in the Municipal Auditorium. The first session will be held on Monday at 2:30 p.m. There will

C. E. KOHLHEPP

H. B. GEAR

E. A. WHITE

also be sessions on Tuesday morning at 9:30 a.m.; Wednesday morning at 9:30 a.m.; Wednesday afternoon at 2:30 p.m. and on Thursday morning at 9:30 a. m., with adjournment at noon on this day.

Registration will open at 11 a.m. on Monday in the grand lounge of the Auditorium. The railroad ticket validation booths will be located in the lounge adjacent to the registration desk. There will be no charge for registration, but registration is necessary to obtain the convention badge, programs, etc. The registration booth will be open on Monday, Tuesday and Wednesday during the sessions.

Recreation

On Monday, June 1st, a card party will be held at the Glen Echo Country Club, St. Louis, Mo., for the ladies attending the convention. Buses will leave the Hotel Jefferson, 12th and Locust Sts., promptly at 2:30 p.m. for the Club, returning about 6 p.m. There will be tables for cards, and for those who do not play cards, games will be provided Prizes will be offered at each table and for the games. There will be dancing on Monday and Tuesday evenings in the Gold Ballroom of the Jefferson Hotel, and a concert in this room on Wednesday evening at 9 p.m.

A sight-seeing tour has been planned for Tuesday afternoon, June 2nd. All delegates attending the convention are invited to attend. The buses will leave the Jefferson Hotel at 2:30 p.m., returning about 5:30 p.m. Reservation cards may be secured at time of registering.

Hotels

A circular, giving rates and locations of the principal St. Louis hotels, together with reservation blank has been sent to all members of the Institute. Reservations should be sent direct to the hotel of first choice.

Transportation

The Passenger Associations have authorized, on the Identification Certificate Plan, a reduced rate of a fare and a third for the round trip from all points of the United States and Canada, with return limit of 30 days from date of sale. The Identification Certificates are good for tickets *purchased on or before May 31st* at the rate specified. Tickets purchased on June 1st or thereafter will be at the rate of 3c. per mile for tickets admitting to sleeper or parlor cars and 2c. per mile for tickets admitting to coaches. Therefore, the *Identification Certificates* permitting passage at the rate of a fare and a third cannot be used to purchase round trip tickets after May 31st. Only one Identification Certificate will be necessary for a delegate and dependent members of his family. To secure the reduced fare Identification Certificate must be presented and signed when purchasing round-trip ticket to St. Louis. Routing, both ways, must be specified when purchasing tickets. The return route may differ from the going route. No change in routing will be allowed after the trip is started. Far Western delegates may find the summer tourist rates of advantage.

All railroad tickets must be validated before leaving St. Louis by the ticket agent at the Transportation Booth in the Municipal Auditorium or at the regular ticket offices in St. Louis.

(*Continued on page* 164)

St. Louis

After Convention Hours

Baseball, Opera and Other Diversions at St. Louis

DELEGATES to the Edison Electric Institute Convention in St. Louis in early June will have the opportunity of witnessing performances by two St. Louis institutions of nation-wide fame.

One, needless to say, is the St. Louis Cardinals, several-times world championship baseball team. It so happens that the Cardinals will be engaged in a series with the Brooklyn Dodgers during the week of the Convention; and while most of the delegates have doubtless seen the team in action in their home towns, this will be an opportunity to see the lads perform on their own grounds.

The other famous St. Louis attraction does not go on the road, and can be seen only by visiting St. Louis. This is the St. Louis Municipal Opera.

Since it was established something over eighteen years ago, the Municipal Opera has been increasingly successful year after year, and now it regularly plays a full season of twelve weeks each summer with capacity audiences of 10,000 in attendance every night.

The Convention members will have an unusual opportunity to learn about the Municipal Opera at close range. The Opera's annual pre-season dinner is to be held in the Jefferson Hotel on the evening of Wednesday, June 3. The entire cast and chorus of "Kid Boots," the opening show on the Opera's 1936 program, will be in attendance at this meeting, and will render a musical and dancing program following the dinner. Through a special arrangement, the delegates to the Edison Electric Institute Convention are invited to witness this program. Here they will have the opportunity of meeting Georgie Price, Ray Middleton, June O'Dea, Joseph Macaulay, Detmar Poppen, Bertram Peacock, Helene Denizon, Vivienne Segal, Audrey Christie, Janet Reade, John Cherry and others who will be seen the first week at the Municipal Theatre.

The Municipal Opera seasons opens on Friday, June 5, the day following the conclusion of the Convention sessions. Delegates will find it well worth their while to remain over in St. Louis in order to witness this spectacle.

The internationally famous St. Louis Municipal Open-Air Opera was founded by a group of civic-minded St. Louisans for the sole purpose of giving the general public an opportunity to share the joys, pleasures, thrills, glamours and beauties which only the al fresco stage can present at ticket prices within the reach of all. It is one of the few truly great organizations that completes its achievements by presenting the world's most distinguished stage artists. Idols of the theater, stars of the cinema, favorites of the radio and sensations of operetta have appeared on the intriguing stage. Still re-echoing in the ears of Municipal Opera-goers are hundreds of such celebrated names of the theatrical and operatic world.

The Opera's stage, 90 by 115 feet, with a natural frame of towering oaks and forestation, has in its center the largest revolving platform in America and the only one outdoors in all the world. Every note of music, every

View of the Outdoor Municipal Opera at Night

The St. Louis Cardinals

spoken word is easily heard in every recess of the spacious theater through a perfect-sounding amplifying system. Hidden by a natural screen of foliage, back of the scenes are scenic studios, property shops, costume studios, dressing rooms, rehearsal stage—a complete modern plant for producing musical shows on an unparalleled scale of spectacular beauty.

St. Louis weather experience promises a delightful climate for the week during which this Convention will be held. Moreover, the Municipal Auditorium, in which the Convention sessions will be held, is completely air conditioned, and is one of the most up-to-date and comfortable meeting places in the United States.

A sight-seeing trip has been arranged for the afternoon of June 2, and will include both men and women delegates to the Convention. On Monday afternoon, a special bridge, cocktail and musical entertainment party for women will be given at Glen Echo Country Club. Each evening of the Convention will be featured by dancing in the Jefferson Hotel Gold Room.

Convention General Information

(*Continued from page* 162)

Arrangements have been made with the New York Central and Pennsylvania Railroads for special trains returning East from St. Louis over these routes. Delegates are requested to use these trains in traveling from the convention, as we must have a sufficient number of reservations in order to hold the accommodations which have been reserved. Reservations may be made when purchasing tickets or when making reservations in St. Louis for the return trip. Schedules of the special trains were listed on page 4 of the Transportation Circular.

Additional Identification Certificates and hotel information may be secured from the general office of the Institute, 420 Lexington Avenue, New York, N. Y.

RATES QUOTED BY ST. LOUIS HOTELS FOR THE 1936 EDISON ELECTRIC INSTITUTE CONVENTION

HOTELS AND LOCATIONS	RATES BY THE DAY		
	Single with Bath	Double with Bath	Twins with Bath
AUDITORIUM Pine & 18th Sts.	$2.00	$3.00—$3.50	$4.00—$4.50
CHASE Lindell Blvd. at Forest Park	3.00—5.00	5.00—7.00	5.00—7.00 Up
CONGRESS Union Blvd. at Pershing Ave.		4.00	5.00
CORONADO Lindell Blvd. at Spring Ave.	2.50 Up	3.50 Up	4.00 Up
DeSOTO Locust at Eleventh	2.00—3.00	3.00 Up	4.00 Up
FOREST PARK HOTEL West Pine Blvd. and Euclid Ave.	2.00	4.00	4.00 Up
JEFFERSON 12th Blvd. at Locust	3.00—5.00	4.00—6.00	5.00—7.00
KINGS-WAY Kingshighway & West Pine	2.00 Up	3.00 Up	4.00 Up
LENNOX Ninth & Washington Ave.	3.00 Up	4.50 Up	5.00 Up
MARK TWAIN 9th & Pine Sts.	2.50—3.50	3.50—4.50	5.50 Up
MARQUETTE 18th & Washington Sts.	2.00—4.00	3.00—5.00	
MARYLAND 9th & Pine Sts.	2.50—3.00	3.50—4.00	4.50—5.00
MAYFAIR 9th & St. Charles Sts.	3.00—4.50	4.50—6.00	4.50—6.00 Up
MELBOURNE Grand Ave. & Lindell Blvd.	2.50—4.00	4.00—6.00	4.50—7.00
PARK PLAZA Kingshighway North of Lindell	3.50 Up		5.00 Up
STATLER 9th & Washington	2.50 Up	4.50 Up	5.00 Up
WARWICK 15th & Locust Sts.	2.00—2.50	3.00—4.00	5.00—6.00
YORK 9th & Market Sts.	2.00—2.50	3.00—4.00	

American Business Men

By Wendell L. Willkie

President, The Commonwealth & Southern Corporation

A radio address over Columbia Network, Station WABC, Wednesday, April 15, 1936

PERHAPS one of the reasons why "history repeats itself" is that, if it did not, we would not remember it. Our memories are notoriously short, and we tend to lose therefore some of the benefits that should be offered by experiences of the past.

I think it is fair to say that prior to six or seven years ago, economically speaking, the United States was leading the world. We had the highest standard of living of any nation. We paid the highest wages. We had enormously reduced the cost of production and distribution. We had a highly efficient and progressive industrial system that was the envy of all other nations. In fact, the whole world turned to us, asking in amazement: "How do you do it?"

We were able to do it because of the amazing efficiency of American business. Here in the United States business men had built a house in which people could live better than they had ever lived before. Then, in 1929, something cracked, and the crack spread, just as many of you have seen a crack lengthen and widen in the wall of a home.

Who was to blame for this?

The politicians immediately said it was the business men, and the politicians have been saying the same thing ever since. They ignored the achievements of other years and recalled only the mistakes and abuses. They pointed to the wild speculation, to manipulation in the stock market, to the promotion of trick companies in which the promoters made money and the people lost, to the occasional concentration of control in none too scrupulous hands.

These were real abuses. The people wisely resolved to correct them. Two laws were enacted: The Stock Exchange Act and the Securities Act. These alone among the many laws that have been passed in bewildering succession during the last three or four years have very largely prevented the recurrence of these abuses.

If the politicians had been content with that—if they had been content with safe regulation designed not to cripple all industry, but to correct the isolated malpractices, this country, in my judgment, by now would have surmounted most of its economic difficulties.

But, the politicians have continued to shout about abuses long since corrected and to lash the business leaders of America with an undiscriminating whip.

These are the men, so say the politicians, who have ruined the country.

Now, I do not pretend to be able to analyze the causes of the depression. It seems to me to be ridiculous, however, to accuse business men of deliberately destroying the very house which they themselves built. The real causes for the depression probably lay in the tremendous overexpansion of industry and other economic maladjustments resulting from the World War—a war which many think was started by politicians and certainly was NOT started by business men.

However, I want to say a word about business men because it has been my good fortune to know a great many of them. Don't let a politician ever tell you that a business man is a fat, white-vested individual with a top hat, sitting in a mahogany office, inherited from his father, and exercising a mysterious power over his fellow men. That myth is old and silly. The real truth is that by and large business men are men who started to work at wages that were less than relief payments are today. They became business leaders because they worked hard enough and intelligently enough to rise to positions of responsibility and trust. They are as a class simple, sincere, and ardently patriotic men. They constitute the most potentially constructive force in America.

Of course there have been exceptions to this. They will have occurred to you while I am talking. There have been men who have proved to be a discredit to business just as there are men who have proved to be a discredit to religion —or men who have been a discredit to politics. No wise person lashes at the church or seeks to condemn all ministers for the moral dereliction of a few. Likewise, from time to time we have discovered dishonesty in government, yet no one would issue a blanket condemnation of government officials for that reason, or seek to abolish Congress every time it did an unwise thing. Recently various abuses have been charged against the relief program, and the President of the United States, very properly, in answer said: "It should be remembered that in every big job there are some imperfections. There are chiselers in every walk of life. There are those in every industry who are guilty of unfair practices. Every profession has its black sheep."

Unfortunately, those words were apparently forgotten except when the administration of relief was being considered. The politicians proceeded against the American industry as if all of it was represented by the worst of it. They sometimes talk as though they are not interested in the recovery of the American industrial system but only in untried reform.

My own industry offers a specific illustration of these methods. The attacks upon the utilities were so severe in 1933 and 1934 that prior to the introduction of the Public Utility Act of 1935 I submitted a plan to the Federal agencies for the solution of the utility question. This plan called for a regulation of utilities so strict as to eliminate all alleged abuses. In addition, among other things, the plan proposed that the utilities would spend for capital construction a minimum in the years of 1935 and 1936 of twice their then anticipated requirements.

It was estimated at the time of this proposal—and not denied by representatives of the government—that the adoption of the plan would have created in the first year of its existence a minimum of three and one-half billions of dollars of business. A sum equivalent to the entire relief appropriations of last year; a sum which would not have come out

of the pockets of the taxpayers; a sum which would have furnished employment to many thousands of men and women; a sum which would have speeded the wheels of other industries turning in order to supply the necessary materials.

The answer to that plan was the DEATH SENTENCE upon the public utility holding companies incorporated in the Public Utility Act of 1935, which, unless declared unconstitutional, will seriously hamper private enterprise in utility operations. Likewise, the Tennessee Valley Authority program with its vast expenditures of public money collected from people in all parts of the country for the subsidizing of the electric rates of a few in a particular section is seriously threatening the financial stability of many utility companies. And all of this in the face of the fact that the correction of every alleged abuse could have been accomplished by regulation and also in face of the offered guarantee of the utility companies to reduce even the TVA rates by more than 25 per cent if given the same gifts from the Federal Treasury as is given to the Tennessee Valley Authority.

Over and above all of this, the continued attack upon the utility and other industry, the personal abuse directed against the individuals who bear the responsibility and trust of the operation of these great enterprises owned by millions of American citizens, has created a hesitancy—a hampering and restricting influence upon expanding activities which would put tens of thousands of men to work. At the time that Congress had under consideration the legislation against utility companies, I said and I say again:

"The fear of American industry today is the fear of the hostile attitude of government itself. The violent criticism of American industry, the drastic and crippling legislative measures which are proposed to reorganize and regiment American business have prevented a restoration of confidence and have retarded the resumption of business activity."

But the fear of government attack has increased.

The price which the American public had paid in order that the politicians could thus enjoy and exercise their hatreds has been incalculable—one essential part of that price is in the existing unemployment. Last year Congress appropriated three and a half billions of dollars for the relief of the unemployed; another billion and a half has just been asked for and yet ten to twelve million men and women are still jobless.

The President of the United States recently recognized this appalling situation and said: "I propose, therefore, that we ask private business to extend its operations so as to absorb an increasing number of the unemployed." I know that the utility business can do its part in this great humanitarian effort by reemploying tens of thousands of people if it is but relieved from government attack—invasion and competition and restrictive and hampering legislation.

I make a plea for a cooperation between government and business. Public abuse and punishment have failed to produce reemployment and economic rehabilitation. Is it not wise to seek to recover the good things we had in the days of our prosperity under a system of free enterprise and cooperation? Isn't the elimination of the misery of the bread lines of greater importance than the attempted accomplishment of untried reforms? The noble desire to render our youth and aged secure and the dream of a better world can best be accomplished if we first recover our lost prosperity. Why not let history repeat itself so that the world will again ask HOW DO YOU DO IT?

Government Control of Privately Owned Land—A Logical Sequence

Dialogue Between Mr. Morris L. Cooke and Senator George W. Norris, during hearing on bill to establish a Mississippi Valley Authority

Mr. Cooke: I was going to quote one sentence from that paper which summarizes my own views. I am abbreviating a bit:

"As matters now stand, and with continuance of the manner in which the soil is now being squandered, this country of ours has less than 100 years of virile national existence. If that represents a reasonably accurate statement it is vastly more significant that we have probably less than 20 years in which to build up the technique, to recruit the fighting personnel, and most difficult of all, to change the attitude of millions of people who hold that ownership of land carries with it the right to mistreat and even to destroy their land, regardless of the effect on the total national state."

Senator Norris. Now there you are getting—

Mr. Cooke (interposing). Down to brass tacks.

Senator Norris. Yes, you are getting down to brass tacks, but you are getting into a field where those who don't want to change the Constitution and who want to enforce it in its literal sense would prevent any development. In other words, you have presented the idea there, Mr. Cooke, that a man—and I am not disagreeing with you at all, but I think we have to come to it—you are presenting the idea that because a man owns 160 acres of land he doesn't owe anything to the public and that he can handle it just as he pleases, but we are coming to the time when there are some things in which the public has an interest, preponderant interest, although he may have the legal title to the land.

Mr. Cooke. This country will not continue a virile national existence unless we can do something to save the fertility of individual plots now held in fee simple.

Senator Norris. Of course, this Bill doesn't undertake to interfere with anybody's legal right. It doesn't take the step that may be necessary ultimately to take.

Mr. Cooke. Answering your question, Senator, as to what can be done, it seems to me that ever since this Administration began, this threatening danger has been more or less understood, and the President's appointment of these various boards and committees and the studies that have been made, the passage of the T.V.A. legislation, these other two bills, this more recent legislation passed by your Committee is all in the same direction, and I simply look upon this Bill or the bill that will grow out of your deliberations as a continuance of that policy.

The Case Against the Mississippi Valley Authority Bill

By Charles W. Kellogg
Chairman, Engineers Public Service Co.

Factual Summary of Testimony in Opposition on Behalf of the Privately Owned Utility Industry

On January 9, 1936, Senator Norris introduced into the United States Senate a Bill (S. 3524) to create a Mississippi Valley Authority. The nature of the measure is substantially the same as the Tennessee Valley Authority Act, which was written by Senator Norris and enacted into law in 1933, except of course as to the area affected and except for certain new provisions which do not appear in the TVA Act. The proposed Bill gives to a Commission of three men general authority over flood control, navigation, irrigation, soil erosion and electric power that may be developed in connection with any of them, in the entire drainage area of the Mississippi River and its tributaries (i. e., from the Appalachians to the Rockies and from the Gulf of Mexico to the Canadian border), except the Ohio Valley which, under the proposed law, would be turned over to the existing TVA.

The Bill was referred to the Committee on Agriculture and Forestry of the Senate, and by the latter to a sub-committee consisting of Senators Pope (Chairman), McNary, Norris, Schwellenbach and Wheeler. Hearings were held by this sub-committee in April, 1936. The private electric utilities of the great area affected appeared in opposition to the Bill, believing, from the identity of authorship and similarity of provisions of the MVA Bill with the TVA Act, that it would inevitably lead to the extension into the larger area of the same sort of activities as the TVA has started and is carrying out in the Tennessee Valley. These would mean the extravagant use of public funds for a general Federal electric power development under the guise of fostering flood control or other Federal functions, all worked out on an accounting basis which would make unfair and ruinous competition for the privately owned electric utilities in the area, whose properties are owned and financed by the very taxpayers whose money would be thus used to destroy them.

The 894 privately owned and operated electric utility companies located in the territory covered by the proposed bill were represented at the hearings by Mr. Charles W. Kellogg, chairman of the Board of Directors, Engineers Public Service Company. He occupied the stand for five days in a thorough presentation of the factual background upon which private industry bases its opposition to the measure. Herein is a summary of his testimony.

The transcript of the hearing containing testimony of some seventeen witnesses representing federal bureaus, national farm organizations, coal producers, river development organizations, and the like, *may be had without charge upon request to the Committee of Utility Executives*, 729-15th Street, N. W., Washington, D. C.

THE 894 privately owned electric utilities which would be affected by the Mississippi Valley Authority Bill are located in all or part of 23 States, are owned by approximately 2,000,000 security holders and represent an investment of approximately $5,000,000,000. They serve approximately 11,000,000 customers in a population of about 46,000,000, and these customers last year consumed approximately 37,500,000,000 kilowatt hours.

In general, the Bill appears to be in contravention of the recently adopted policy of Congress, covered by Senate Resolution No. 217 (the Byrd Resolution), pursuant to which a Board of experts has been appointed to study existing governmental agencies for the purpose of promoting economy and efficiency and preventing overlapping of functions. The MVA Bill (S. 3524) overlaps with a non-technical, politically appointed Board the century-old practise of having the Engineer Corps of the U. S. Army design and carry out flood control and navigation measures, and the practise of 35 years, since the passage of the Reclamation Act, of having the Bureau of Reclamation perform these functions for irrigation projects. The Bill, therefore, is a move toward further duplication and in contravention of Congressional policy adopted at this session.

Not only is the proposed Bill a duplication of government activities, but it is also premature. A National Resources Committee was created by President Roosevelt in 1934 and was recently requested by him to prepare a "National Water Plan," directed to "control of floods, erosion and water pollution; to the use of water for domestic purposes, irrigation and power, and to the drainage of water-logged and overflowed lands." On March 27, 1936, it was officially announced (Release No. 013) that this Committee would report to the President before December 1, 1936. In view of this study being made at the President's special direction, the proposed Bill would seem to be not only a duplication of government activity, but also premature.

In addition to the various provisions similar to the existing TVA Act which appear in S. 3524, there are two provisions of a more repressive and directly competitive nature than appear in the TVA Act. The first of these is in Section 14, which calls for cancellation on one year's notice of any power contract between the proposed MVA and a private utility company—no such cancellation provision existing with respect to a contract with a governmental body. In the TVA Act this cancellation period is five years. From the time required to plan, finance and subsequently construct any substantial power development, whether steam or hydro, it is obvious that this one-year cancellation provision in effect discriminates unfairly against privately owned utilities to the extent of practically taking away from them the firm use of power produced from the taxes which they pay, and is a most unfair discrimination.

A further provision, not appearing in the TVA Act, which is part of the proposed Bill is that in Section 16, authorizing the MVA to construct or operate any steam plants to be used as standby plants in connection with hydro generating plants. Even if it might be contended that in certain cases the government was justified in developing hydro-electric power in connection with

the performance of other Federal functions, the same thing could not be said of a steam power station, which is direct competition with private utilities.

Conflicting Policies

With regard to the irrigation provisions of the Bill, it was pointed out that none of the irrigation projects in the arid West has so far proved to be a success financially, and that even the few which have been able to pay the operating and maintenance costs have been unable to pay back the investment to the government. Attention was called to the waivers or postponements of payment of principal by the irrigation districts permitted by Acts of Congress of April 1, 1932, March 27, 1934, and June 30, 1935. At the present time S. 4232 and H. R. 10751, passed respectively by the Senate and House, provide a further postponement of the payment of half of the investment charges for 1936. The argument was seriously urged at this time of a seriously unbalanced Federal budget, provision for further expenditures on unprofitable irrigation enterprises should be eliminated. Regardless, however, of the profitableness or the reverse of irrigation projects in general, no expenditures should be made to bring into cultivation additional lands by one agency of the Federal government when another agency is spending hundreds of millions of dollars to withdraw existing farm lands from cultivation.

The sound development of flood control, irrigation or navigation projects is a highly technical matter requiring the highest standard of engineering experience and trained judgment. Heretofore it has been the policy of Congress to have river improvement and flood control designed and supervised by the Engineer Corps of the Army, and to have irrigation development similarly designed and supervised by the Bureau of Reclamation. The proposed MVA Bill not only ignores these established branches of the Federal government but turns the whole matter over to a politically chosen Board. Not only would the Board itself be political but all of its managers, officers, employees, attorneys and agents shall be chosen (Section 4) *"without regard to the provisions of civil service laws applicable to officers and employees of the United States."* It is true that Section 7 of the Bill prohibits the application of any political test in appointments or promotions and authorizes the MVA Board to call upon the Civil Service Commission for assistance in making rules and regulations for appointments and promotions, but this does not affect the generality of the provision in Section 4, which completely sets aside the provisions of the civil service laws applicable to officers and employees of the United States.

No Control of Accounting

The MVA, furthermore, is practically free of accounting control, the activities of the Comptroller General of the United States (See Section 9) being limited to an annual audit, the scope of which appears to be restricted to the accuracy of the accounting. This furnishes no protection for either the public or the privately owned utilities against the improper allocation of investment costs between the four major categories of construction work; this is of the essence of the unfairness of the competition which has been and is being affected by the TVA and presumably would follow similar lines in connection with the MVA if the proposed Bill should become law.

Attention was called to the fact that already a great deal had been accomplished to develop navigation and control of floods on the Mississippi River and its tributaries. The Federal government has been working on these matters for a hundred years; so far as navigation is concerned, the principal streams of the Mississippi Valley are already improved. The Ohio River already has a 9-ft. channel. The canalization of the Monongahela and the Kanawha is virtually completed. The lower Mississippi has a 9-ft. channel; the middle Mississippi is. largely completed to 9-ft.; work on the upper Mississippi is now in progress and a capacious 9-ft. channel will soon be available as far as Minneapolis; the 7 to 8-ft. channel to Kansas City on the Missouri has also been completed and is being extended to Sioux City. The 9-ft. channel on the Illinois is largely completed. The Tennessee is now undergoing improvement by the TVA and a 9-ft. channel on it will be completed in a comparatively short time. During this long time the government has expended $503,108,000 on navigation improvement, with $142,653,000 required to complete. For flood control, Federal expenditures have totaled $378,243,000, with $98,046,000 required to complete—a grand total for both purposes of $1,122,051,000.

The foregoing comments apply to the MVA Bill largely from the viewpoint of taxpayers in general. The utilities protest against the ruinous competition to their business provided for under the proposed Bill. The private electric industry feels that a democratic form of government is a cooperative organization set up by the people to perform for them those functions of protection and safety which from their nature the individual cannot do for himself. For this purpose the people submit to taxation and the regulation of the law; but they do it for their own benefit, not for the government. In a word, government is a means, not an end in itself. Confident in the soundness of this belief, the electric industry presents as its most fundamental objection to this Bill the ruinous competition which it sets up against a legally organized and publicly regulated industry, which the function of government should be to protect and foster rather than to attack and destroy.

Government Destruction

The mechanism which the Bill sets up for this destructive competition is simple and effective and consists of:

1. The allocation to power plant investment of a relatively small part of the entire Government investment in a given project (where a private company, if making the development, would be obliged to carry the total investment itself) and
2. The elimination of any charge for interest in rates to customers for power sold (Section 13).

The reason these two provisions are so ruinous competitively is because the fixed charges on investment represent probably 85% of the cost of furnishing hydro-electric power. If it should be claimed that the authority to allocate costs between flood control, navigation, irrigation and electric power will be fairly exercised, one can only point to the actual performance of the Tennessee Valley Authority; and the proponents of the Bill seem to consider that the actions of TVA are a fair measure of what would be expected from the MVA.

This led immediately to a complete discussion of the so-called "yardstick" which TVA costs should furnish of a fair charge for electric power throughout the country. The ideal of the yardstick was set forth by Arthur E. Morgan, Chairman of the Tennessee Valley Authority, in an article which he wrote for "The Forum" in March, 1935, in which he expressed the idea in the following words:

"The President wishes that somewhere in America there should be a case of public generation, distribution, and sale of power. He is of the opinion that power developed

in this country ought not everywhere be a public project, that private development of power has decided advantages and ought not to be abandoned. But he feels there ought to be here and there cases of public ownership which can serve as comparisons. And if they are to serve as comparisons, they must be open and above board, with nothing hidden. They must be fair, with no special arbitrary advantages. They must pay taxes, just as private utility companies must do, and every other reasonable charge, if they are to provide us with a fair comparison."

How far practise in TVA has departed from the principle set forth by the Chairman was brought out in the testimony as follows:

It was shown that allowing $250 per kilowatt for power plant investment, 6% of plant investment for interest (meaning thereby the necessary rate of return to attract capital through both bonds and stock), 2% for taxes, which would correspond about with what the utilities actually pay, and 2% for depreciation, which will allow a 50-year life, as envisaged by the Federal Water Power Act, would make total charges of 10%, or $25 per kilowatt per year. Allowing a 50% annual load factor and 1/10 of a cent per kilowatt hour for all operating and maintenance costs would add $4.38 per kilowatt—or a total of about $29.38.

Interest Eliminated

Under the proposed Bill interest is eliminated entirely and under the TVA practise taxes are fixed at 5% of the gross as against the 14% of the annual gross paid by the utilities country-wide. On this basis fixed charges would be 2.72% for the government plants, or $6.80 per kilowatt per year—a grand total of about $11.00 per kilowatt year. On this basis the yardstick would be about 11/29 of its full length, or about 14 inches long.

The foregoing, however, is only part of the story, for it includes only the elimination of interest and the inadequate provision, compared to private utilities, for taxes. In addition to this inadequacy the proportion of the total investment allocated to power development by the TVA is patently insufficient. For the last fiscal year for which the TVA has reported (1935), page 63, the total investment in programs to and through June 30, 1935, is given as $48,487,500, and of this amount only $3,142,500, or about 6½%, is allocated to electricity. The inadequacy of this allocation was shown in various ways in the testimony presented at the hearings. In the case of Muscle Shoals, which was taken over by the TVA under the act, it was pointed out that the cost of Wilson Dam at Muscle Shoals, as reported in TVA testimony in the Alabama Public Service Commission case, was $46,951,000. The amount reported charged to power by the Army Engineers (Page 20, Part I, House Document No. 328, 71st Congress, Second Session, March, 15, 1930) was $37,000,000. The amount charged to power by the TVA, according to the testimony of Llewellyn Evans, Chief Engineer thereof (Exhibit 76 of the Alabama Public Service Commission case), was $19,529,000, or 41.6% of the total. While this proportion of investment charged against electric power was much smaller than allocated by the War Department, it was still over six times as large a percent as was allocated to power by the TVA in its other activities.

Similarly in the case of Norris Dam, which is nearing completion by the TVA, it was pointed out that the estimated cost of a dam for flood control alone, made by the Army Engineers in the so-called Kelly Report (of December 1, 1927, Committee Document No. 2, 70th Congress, First Session) on Page 40, would be $19,630,000, while the cost of Norris Dam, with its greater height and 98,000 kilowatts of generating capacity, was $36,400,000. It was stated that the difference between these two, or $16,800,000, would be a fair measure of the power allocation at Norris Dam. In this case, however, the cost per kilowatt would be $171 and, as stated on Page 5 of the last annual report of the TVA, "the power generating equipment at Norris Dam will not be used during most of the year," so that all of the power output would be "secondary" or "dump" power and hence the installation of any electricity at Norris Dam is not economically justified.

Power Costs Not Balanced

A further measure of the relative amount that should be charged against power compared to other functions arises out of the same House Document No. 328 above mentioned, which gives the estimated cost of flood control on the Tennessee River. In the same stretch of the Tennessee River in which the TVA proposes to build eight dams at a total cost of $236,000,000, this report shows the Army estimates that navigation dams alone would cost $58,000,000, so that based on these figures it would seem as though 75% rather than 6½% of the total investment should be charged against electric power.

The figures in this and the preceding paragraphs are felt to be conclusive to the effect that the yardstick, as worked out to date by the TVA, is not fair, that it does give special arbitrary advantages to the government, that it eliminates entirely interest on investment, charges as taxes about 36% as much as private utilities have to do, and involves an allocation of investment against electric power entirely inadequate to represent the true difference in investment cost between what would be required for the government functions of flood control and navigation and what is spent for power alone.

The same inadequate presentation of the facts appears in the published reports of government-owned utilities which purchase power from the TVA. In the 1935 annual report of the TVA, Page 33, it is stated that the financial experience of municipalities and county associations distributing electricity at the standard TVA rates has been completely satisfactory. Financial statements of these seven municipalities and county associations are shown on Pages 73 to 76 of the annual report, and the claim is made (Page 33) that revenues have been more than sufficient to cover costs and that substantial net income has accrued from their operation. Analysis of these figures indicates that they were obtained by substantial government subsidy. In the case of Tupelo, Miss., for example, which reports sales of 504 refrigerators, 171 ranges and 56 water heaters, and an increase in customers during the year from 1,352 to 1,644, the entire commercial and new business expense is reported as $1,675, an amount barely sufficient to pay the salary of one man. As against this the report shows that the TVA had 154 employees on the payroll in the Mississippi Division of the Division of Operation, and shows furthermore that the TVA budget for 1935 carried $100,888 for sales promotion work, and the Electric Home and Farm Authority, at that time affiliated with the TVA, carried $100,216 for promotion and dealer contact, and $100,913 for educational programs. The conclusion is inescapable that in the case of Tupelo and the other six small properties the amount charged for new business expense was a small fraction of the total amount actually spent by TVA or its affiliates for the benefit of these places. Mr. Norris admitted at the

hearings that without TVA behind them these little towns could not have made the showing they did (p. 50, of Transcript). The entire operating cost of one of these power associations, Alcorn County Electric Power Association, for all expenses exclusive of power, was but one-quarter as much per kilowatt hour as the average municipal plant of the United States in cities under 2,500 population.

As a further check on the inadequacy of TVA charges for power, comparison was made with the published reports of the Ontario Hydro-Electric Commission. According to the 1935 report of the TVA, Page 29, the average rate to the municipalities and county power associations was 5.78 mills per kilowatt hour, which, at an annual load factor of 50%, showed about $25 per kilowatt year. As against this, the Ontario Hydro, for an average of 11 towns in Ontario of the same general size as Tupelo and the same average distance from Niagara Falls, showed costs of over $44 per year. As indicating that these costs were not excessive, it was pointed out that throughout the 27 years of its existence, the Ontario Hydro had been able to amortize its investment to the extent of only about 10%, and it was further pointed out that from 1931 to 1935 inclusive the major part of the obsolescence and contingency reserve, which at the beginning of that period was $14,632,000, had been used up in making up for deficits resulting from too low a price to municipalities. Incidentally, it was pointed out that the cost of hydro power to the Ontario Hydro-Electric had increased substantially since the early years, when Niagara power alone was available, the average cost per kilowatt having increased from $19 in 1918 to $37.50 in 1934.

The TVA Rate Fallacy

With regard to the effect of rate reduction increasing domestic consumption of electricity, figures were produced by the members of the Committee, obtained from small municipalities purchasing TVA power, showing on a percentage basis very large increases in energy consumption per household after the introduction of TVA rates. The fallacy of relying on percentages in a case like this was pointed out, the point being made that a large percentage increase might mean merely a relatively poor showing to begin with. Figures from comparable Canadian cities were adduced to show the preponderant effect that the presence of natural gas or other cheap fuels has upon average residence consumption of electricity. In two towns, each about the same distance from Niagara Falls in Ontario as Tupelo is from Wilson Dam, one with natural gas and the other without, the average annual residence consumption of electricity was respectively 900 kilowatt hours and 2,000 kilowatt hours. It was further shown that in a case of one small company in New Mexico, a part of the witness' system and whose number of customers was substantially the same as Tupelo, Miss., the annual kilowatt hour consumption per residence customer of 1,783 in 1935 was not only larger than in any of the TVA cities but had shown a larger increase over the previous year (316 Kwh.) than any city in the TVA territory.

In answer to the claim set up by its proponents that the TVA competition and example was the reason for substantial rate reductions by private utilities throughout the country, the point was stressed that the establishment of inducement rates (providing for large decreases in unit rate for successive increases in consumption) was a policy which the private utilities had inaugurated and consistently pursued for many years before the TVA came into existence. Figures were introduced purporting to show the saving in cost per kilowatt hour to residential electric customers throughout the country, arrived at by multiplying the residential energy consumption for each year by the reduction during that year in the average rate per kilowatt hour for residence service. This showed the following figures:

Year	Sales to Res. Million Kwh.	Rate Reduction from Previous Year (Cent)	Reduction in Dollars
1926	6.827	0.30	$ 20,500,000
1927	7.723*	.18	13,900,000
1928	8.619	.19	16,400,000
1929	9.773	.30	29,300,000
1930	11.018	.30	33,100,000
1931	11.738	.25	29,400,000
1932	11.987	.20	24,000,000
1933	11.960	.09	10,800,000
1934	12.797	.19	24,300,000
1935	13.978	.27	37,700,000
Ten Years		2.27	$239,400,000

*By interpolation.

It was pointed out further that the saving during the first year, 1926, for example, continued for nine years thereafter, that for 1927 for eight years thereafter, etc., and that on this basis the cumulative saving through the ten year period amounted to $1,226,700,000. The same analysis showed that this cumulative saving through 1932, the year before the TVA Act became a law, was $1,110,000,000.

With regard to the possibility of continuing rate reductions, with the expectation that this would continue to produce greater individual consumption in the home and consequently increased earnings, it was pointed out (and readily conceded by members of the Sub-Committee) that there was bound to be a point of diminishing returns in this process, since otherwise the logical conclusion would be that the nearer the rates got to zero the higher the earnings would be. In this connection it was pointed out that three factors might at any time not only cause a halt in rate reduction but require increases in rates, these factors being:

1. Saturation with respect to the introduction of electrical equipment in the household.
2. The possible effect of inflation in raising costs of labor, fuel and other materials.
3. Further increases in taxes, which on the basis of percentage of gross, have nearly doubled in the last 15 years.

Another claim set up by Committee members was that the effect of TVA competition had been to stir up greater sales effort on the part of private utilities in the TVA area than in other parts of the country. While admitting that competition is naturally likely to incite competitors to greater sales effort, figures were introduced to show that, with the same degree of managerial skill applied in both cases, results did not indicate that sales in the TVA territory in 1935 had shown a greater gain over the past than was shown outside of such territory. For this purpose figures from the Commonwealth and Southern group of properties were used, that company having three principal subsidiaries in TVA territory and three principal subsidiaries outside such territory. 1935 sales of electric merchandise in percent of 1930 sales by the three subsidiaries in TVA territory (Tennessee Electric Power, Alabama Power and Georgia Power) averaged 126.7, and the same figure with respect to the three subsidiaries outside the area (Ohio Edison, Central Illinois Light and Consumers Power) showed an average of 163.4.

It was admitted in testimony that through the 1935 report the actual production and sale of electricity by the TVA had been relatively trifling. Of the 122,630,000 kilowatt hours gener-

ated in the fiscal year 1935 all but 19.5% was consumed by TVA's own activities, so that only about 24,000,000 kilowatt hours were actually sold by TVA during the year to the public. The menace was the threat for the future.

EHFA Claims Unfounded

One of the claims vigorously asserted by Senator Norris was the value of the work done by the Electric Home and Farm Authority, then an affiliate of TVA, in causing a reduction in the cost of electrical equipment. The figures of actual performance by the industry itself do not bear out this TVA claim. In the case of electric refrigerators it was pointed out that for the year 1920, the first year that figures on refrigerator sales nation-wide were available, only 10,000 refrigerators were sold and the average cost was $600; that there was little increase in the number of refrigerators sold until the year 1926, when the number sold was 210,000 and the average price had been reduced to $390. Sales continued to gain thereafter and in the year 1932, the year before the TVA Act was passed, total sales were 770,000 and the price had been reduced to $190. Since 1932 the sales of refrigerators had gained even more rapidly, the total sold in 1935 being 1,567,000 and the average price being $166. In a word, while the industry, unassisted by TVA, had effected a reduction in price from $600 to $190 over a period of years, the only further reduction after the TVA came into existence, was about $25 per refrigerator.

Similarly in the case of electric ranges, the average price was reduced from $176 in 1924 to $129 in 1932, and the average price in 1934 was $127—a very slight reduction from what had already been achieved by private industry prior to TVA. In refutation of the claim that TVA had greatly stimulated household equipment sales in its territory by private utilities, the figures presented showed that the private utilities in Georgia, Tennessee, Alabama and Mississippi sold 7% of the electric ranges of the country in 1930 but only 5% of the national total in 1934.

It was pointed out, that the real damage arose from the threat of future competition backed by the inadequate allocation of investment and charges for the use of the same involved in the TVA set-up. The effect of this threat was shown most clearly by comparing the most recently available quotations on the preferred stocks of the two groups of Commonwealth and Southern subsidiaries, respectively in the TVA territory and outside of it. The average price of the preferred stocks of the three subsidiaries inside the area was 70 and of those outside of the area 105.2—all of these being 6% preferred stocks.

Conflicting Aims

Considerable stress was laid on the essential inconsistency in most cases between flood control and navigation improvement on the one hand and production of hydro-electric power on the other—the point being made that for maximum flood control the reservoir behind a dam would have to be empty before the flood came, at which time power production would be zero, and that after the stored flood waters had been fed out gradually during the navigation season for the improvement of navigation, the reservoir behind the dam would again be empty at the end of the navigation season, thus again producing no power under such conditions. An example cited of ideal flood control was that of the Miami Conservancy District, designed and constructed by Dr. A. E. Morgan, in which the reservoirs were entirely empty except when a flood arose, and in which the regulation arose entirely automatically from the size and nature of the openings in the dam. These conditions were freely admitted to exist by Senator Norris.

The situation at Norris Dam was pointed out in this connection, the statement being made on Page 5 of the last annual report of the TVA "that power generating equipment at Norris Dam will not be used most of the year"; and it was also pointed out, as above stated, that with all of the electric energy which would be obtained from Norris Dam being secondary or dump power, it was probable that the investment in a higher dam and electrical equipment at Norris Dam were not economically justified, taking the measure of power investment as being the difference between the $36,400,000 spent by TVA for flood control, stream regulation and power, and the $19,630,000 estimated in the Kelly report for flood control alone—or $16,800,000 as the net power investment. On the basis of these figures Mr. Norris was inclined to concede that power development at Norris Dam was uneconomical, but he claimed the benefit of regulated flow for the production of power at other dams further down the Tennessee River.

In this connection it was pointed out, however, that in order to be entirely consistent with the Federal purpose of improving navigation, this regulated flow of the stream must at all times be passed through or over successive dams lower down on the Tennessee River, which therefore made these dams all run-of-river dams; and on this basis it was claimed that the cost of power from these successive dams, if the allocation of investment charges was such as to charge against power all amounts expended in excess of what would be required for navigation alone, would still be very high—in some cases so high as to be economically unwarranted. To substantiate this point the following figures were presented, taken from TVA reports:

Dam	*Cost Including Power Machinery*	*Primary Kilowatts of Power Based on Regulated Flow*	*Cost Per Kilowatt*
Wheeler	$32,000,000	66,000	$480
Pickwick	29,660,000	76,000	390
Guntersville	30,975,000	45,000	688
Chickamauga	30,650,000	50,000	615

The total cost of eight dams on the Tennessee River, reported by the TVA at $236,000,000, were, as above stated, represented by $58,000,000 as the War Department's estimate for dams for navigation, which would indicate that 75% of the cost might fairly be allocated against power, but even if only 50% of the cost should be charged against power, the average cost per kilowatt is on the whole higher than would be justified on economic grounds.

The conclusion seems to be inescapable that the real purpose behind the MVA Bill is to extend into the great area covered by the Mississippi drainage basin the general plan envisaged in the TVA Act: to utilize the Federal functions of flood control, navigation improvement and irrigation as a basis for getting the Federal government, in a country-wide way, into the electric power business, for the purpose of taking the utilities away from the private companies. Statements published by the author of the Bill as long ago as 1928* were read into the record and were again avowed by him. These statements were as follows:

"Either the American people must tamely submit to the economic and political control of the Power Trust or support the group in Congress which advocate the creation of a far-flung national super-power system. . . ."

"This publicly owned super-power system should cover every section of the country

*Plain Talk for July, 1928. Article entitled "Politics and Your Electric Bills," by George W. Norris.

(*Continued on page* 196)

Air Conditioning Promotion in Chicago

By William P. Rock

Commonwealth Edison Company

From a talk before the Great Lakes Power Club

AIR CONDITIONING interest among central station customers is not lacking, but a lack of knowledge and understanding prevents many from obtaining the benefits of proper air conditioning. The air-conditioning department of the Commonwealth Edison Company classifies all inquiries, and follows up all leads with advertising material and publicity regarding jobs just obtained.

Profit Motive

The value of restaurant air conditioning is proven by a check-up which shows that at a cost for air conditioning of 1.5 cents per meal served, the average customer's check increased 10 cents.

Competition Motive

A Chicago druggist came into the office to inquire about air-conditioning costs.

He was very emphatic in his statements that he didn't want to spend money, and that he didn't believe air conditioning would improve his business.

It finally came out that he had information to the effect that a chain drug store across the street is to have air conditioning this Spring.

The rebellious druggist then admitted he intended to install air conditioning as a protective measure to retain his present business.

Utilities and Air Conditioning Development

Because air conditioning can provide year 'round comfort and health for human beings while occupied in their many indoor duties, necessities and relaxations, it cannot be prevented from growing rapidly into one of the greatest industries ever known. Everyone wants it because everyone wants to be comfortable as well as raise his or her standard of living. Therefore, it behooves all utility companies to so thoroughly familiarize themselves with the subject of air conditioning that they can provide it with that guidance and influence which will reflect to their best interests.

Air conditioning as applied to industry is not new. Theaters for many years have depended upon air conditioning to eliminate the summer slump in their business. The World's Fair in Chicago in 1933 seemed to introduce air conditioning as we know it today—an industry profitably applied to all living and working within doors.

Beginning in 1933, the Commonwealth Edison Company of Chicago established a separate division to handle air conditioning. In Chicago prior to 1933, air conditioning of all descriptions was represented by 28,000 horsepower connected load. To this amount, activity during 1933 added 2700 horsepower. 1934 added another 6800 horsepower, which was more than double the horsepower added in 1933. In 1935, 317 installations have added 5800 horsepower to service on our lines. The total horsepower on this utility's lines for this class of business is now 48,000 as represented by 934 separate installations. (317 is 1/3 of 934.) Investigation of customers' bills has shown us that the annual average income per horsepower from air conditioning conservatively averages $12. Therefore, our yearly income due to this new industry has been built up to $600,000.

Today 50 per cent of all theaters in Chicago are air conditioned. Restaurants are next in percentage saturation with 4 per cent being air conditioned. All other classifications are only fractions of one per cent saturated. With this great market ahead for new air conditioning and with over half a million dollars yearly income already on our lines, and having increased our air-conditioning load in three years' time by 75 per cent, you can well see that time is not distant when millions of dollars annually will be coming from this air-conditioning load.

New installations in 1935 include 51 restaurants, 31 theaters, 28 clothing stores, 61 private offices, 31 general offices, and 24 residences. Very encouraging has been the display of acceptance by new classes of business this year. Air-conditioned beauty shops have more than doubled; so have doctors' offices, candy stores, drug stores, and undertaking establishments.

The Commonwealth Edison Company, like most public utilities, does not yet merchandise air-conditioning equipment. To install air conditioning requires considerable labor, including sheet metal work, plumbing, steam fitting, carpentering, wiring, and painting. Such labor represents 40 per cent of the cost of making an air-conditioning installation. In a city like Chicago, the labor question is very delicate and often ill feeling exists. Utilities can gain more by cooperating impartially with all contracting companies and other related groups in the air-conditioning business. Leads to names of prospective buyers can be gained by the utility by canvassing, by telephone, from employees, direct-by-mail, and newspaper advertising, and after being qualified, referred to the companies that sell and contract for air-conditioning installations. Utilities should be a clearing house for information so that all contracting companies can keep in touch with individual sales being made each month. This helps sales directors to follow the trend of sales and see how well their organizations are getting their shares of the business. (Classified Lists) (Newspaper Publicity).

The room cooler or self-contained unit development has been very rapid in the last two years. These room coolers rarely take over 1 horsepower, and there are quite a few types, several of which are air cooled.

The Edison Company feels that the development of room coolers is a matter of very great importance to the utility companies, as they will ultimately be followed by the installation of a complete air-conditioned job, and within the next few months we will be compelled to decide as to whether those companies who sell the larger types of electrical merchandise are to sell room coolers the

same as they now sell domestic refrigerators. It is entirely possible that should those utility companies who are familiar with the sale of large appliances go into this field, it would cause a wonderful stimulus in the general use of air conditioning.

Chicago is beginning to feel the effects of long overdue building programs and remodeling. Chain organizations are beginning to expand in order to better utilize the increased rate of money in circulation. Air conditioning will benefit tremendously by this new trend because very few establishments will remodel or build without including air conditioning in their program. That such a trend exists is borne out by air-conditioning sales during the latter part of 1935.

In promoting air conditioning, the fact that everyone would like to have air conditioning must be kept in mind. People do not have to be sold the idea of having it. Therefore, promotion must be different from that applied to most merchandising, the cost of installation being the present stumbling block. The public must be educated to understand the reasons for the heavy equipment involved and, therefore, the justification for the high cost. It now appears advisable to rapidly acquaint the public through advertising with the actual cost to equip residences, offices, buildings, stores, etc. By so doing, the public is prepared to think of the new industry in its true light. They will measure their own discomfort in severely hot weather against the cost of relief, which is the best salesmanship that can be provided. Then when they come in contact with air conditioning they will appraise the comforts in terms of cost. There is no use hiding the price problem, as it must come out sooner or later. By making it an early issue much time of engineers, salesmen, and all others concerned is conserved. Utilities can benefit greatly by gathering samples of various makes of air-conditioning equipment into an exhibit on its display floors, so that all interested parties can visit it. By all means utility display floors and offices should be conditioned.

Those buying air conditioning at present are not the householder—he will come later—perhaps two or three years. Utilities should spend most of their time in reaching the executives who determine whether or not air conditioning is to be provided. Nicely prepared brochures can do much to show these executives how rapidly air conditioning has progressed, how readily accepted, how it pays for itself and how easily applied. Although utilities do not at present sell, they should be active in impartially directing all those interested in learning what, where, and how to buy the proper equipment at a reasonable price. It is best for utilities with the problem of air conditioning to act as a hub of impartial information—a coordinator of the many questions and problems.

Utilities are apt to pay too much attention to only the summer features of refrigerated air conditioning when there are other types and other features. Attic fan ventilation to provide night cooling is very effective and offers a desirable electric load. Several small well-water cooling systems have been installed this summer in Chicago, but so far have yet to prove themselves. Such systems require from one to five horsepower motors on the pumps and one-half to two horsepower on the fans. Air filtration is particularly important to those suffering from hay fever. Humidification in winter offers utilities a splendid winter load that has hardly been scratched. Large amounts of water must be forced into warm air streams in winter. All these phases must be well known to utilities; so that, if complete year 'round air conditioning does not fit the pocketbook of customers, some partial form may be suggested satisfactorily.

Electric utilities must carefully watch the trends of other than electrical operation in this new industry. About a dozen large cooling jobs throughout the country are supplied by steam ejector systems. Three installations of cooling by dehumidification which utilize silica-gel and are heated with gas have been installed in Chicago by the Bryant Gas Burner Company.

It is well to point out that a new electrically driven centrifugal water-vapor machine for cooling has been introduced. It has a very high efficiency rating, and is a splendid competitor of steam jet refrigeration for those adverse to chemical refrigerants.

The subject of rates for air conditioning is also necessary for consideration. Special rates can be helpful in encouraging the use of air conditioning. The demand charge rate often works excessively in comparison with the amount of use of equipment during the early and late periods of the summer when cooling is needed for only a few days. This is no fault of the desire of the customer, but a condition of nature. Such is particularly true of the smaller installations where customers are accustomed to using small quantities of electricity. It is not uncommon in such installations for air-conditioning bills to run equally as high as those for all other services. This is particularly true where customers have never before required power services. Air cooling income ranges from six dollars per season per horsepower for large customers to thirty-five dollars per season per horsepower for small customers.

From the standpoint of utility engineering, air conditioning introduces new practices. Most commercial customers and nearly all residential customers have never needed separate power services. Air conditioning with refrigeration changes this and in most cases wherever installed requires new separate power services with resultant new spans of wire, larger transformers, poles, etc. Even for individual room coolers in residences or small businesses where ¾ or 1 horsepower motors are used, a separate leg often must be run in from the alley in order to provide 230-volt service.

To cities like Chicago which have metropolitan sections operating on direct current, air conditioning creates a demand for alternating current, particularly where the local utility has intentions of gradually cutting over the district to alternating current. This is partly because alternating current in such districts is sometimes sold at a lower rate than direct current. Besides, alternating current equipment for air conditioning is lower in first cost and is therefore additionally desirable to the customer. From the utility's standpoint large alternating current motors for air conditioning in direct current districts represent that much less equipment eventually to finance when cutting over the district to alternating current.

Utility engineering departments have routine for handling line extension estimate requests. These requests require from ten days to two weeks to normally clear through and back to the party making the request. The extension then must be authorized, after which the street department operating on a weekly schedule usually places the work in its next-week schedule. Therefore, from the time of origination of the request until the work is actually started often requires three weeks. During the hot months of June and July this amount of delay is by no means satisfactory to the contractor of air conditioning or to the

customer. The utility does not often learn of an air-conditioning job until after the contract is signed. Sometimes the utility is not notified of needed new service until installation of equipment has almost been completed. When a customer signs a contract for air conditioning during the hot season, he wants immediate installation. If the electric service is not ready by the time the installation is ready, no matter who may be at fault, the electric company is usually blamed. Utilities can improve their methods of handling this new demand in two ways. All manufacturers and contractors of air-conditioning installations must be acquainted with the utility procedure and asked to give cooperation by preferably checking the power situation when air conditioning is first being considered by its customers at locations or at least by giving immediate notice when the contract has been signed. Secondly, engineering departments should be prepared in these particular cases to make its field survey and estimates immediately rather than follow routine and make them await their turn. The actual time required in preparing these estimates is not much more than a day. It probably, therefore, would be more advisable during June and July to have one man assigned in the engineering department to specialize in air-conditioning extensions and go out immediately when a rush order comes up. Such cooperation will reflect credit upon the electric company and eliminate much hard feeling. It also helps air conditioning to appear to be more simple to install and more desirable to have. Customers hesitate longer in signing up for air conditioning when they know that they cannot have the cooling for three or four weeks although it is needed immediately.

With air conditioning growing at such a rapid pace, and with such a brilliant future, it is well to have some men in each utility spending full time in guiding and charting its growth. It is well to watch over these new problems and find their solutions so that utilities can lead air conditioning and not allow air conditioning to lead them.

To Secure Good Accommodations

Convention Reservations

Should Be Made Early

SALES—ELECTRIC REFRIGERATORS

(Household Models Only)

MONTH OF MARCH AND FIRST THREE MONTHS OF 1936-1935

	Month of March, 1936	Month of March, 1935	Month of February, 1936	First Three Months, 1936	First Three Months, 1935
Total United States	272,139	213,464	179,056	570,959	432,415
Maine	995	1,138	1,007	2,247	2,077
New Hampshire	880	795	990	2,111	1,405
Vermont	530	516	576	1,225	890
Massachusetts	9,985	7,879	8,479	22,576	16,717
Rhode Island	1,458	1,087	1,370	3,262	2,144
Connecticut	4,404	2,973	3,381	8,995	5,928
Total New England	18,252	14,388	15,803	40,416	29,161
New York	26,963	19,059	19,940	57,959	39,387
New Jersey	13,413	10,047	8,269	26,782	17,157
Pennsylvania	23,571	22,274	12,895	48,506	38,300
Total Middle Atlantic	63,947	51,380	41,104	133,247	94,844
Ohio	15,369	13,225	9,616	32,994	29,247
Indiana	8,024	6,069	4,658	17,034	12,301
Illinois	19,392	16,513	11,521	39,082	31,556
Michigan	10,167	10,042	7,811	23,369	20,519
Wisconsin	4,433	3,733	2,910	9,624	7,451
Total East No. Central	57,385	49,582	36,516	122,103	101,074
Minnesota	3,477	2,799	3,451	8,568	6,837
Iowa	4,599	4,262	3,111	9,599	9,053
Missouri	11,460	8,958	4,871	20,201	18,725
North Dakota	571	553	684	1,442	1,073
South Dakota	804	929	831	1,972	1,826
Nebraska	2,553	2,293	1,555	5,472	6,095
Kansas	4,016	3,913	2,001	7,965	7,376
Total West No. Central	27,480	23,707	16,504	55,219	50,985
Delaware	476	677	244	991	1,139
Maryland	3,347	3,765	2,215	6,691	6,745
Dist. of Columbia	2,765	1,684	1,345	5,280	3,208
Virginia	4,030	3,948	2,821	8,478	7,651
West Virginia	3,340	2,127	2,148	6,569	4,864
North Carolina	5,810	3,740	3,864	11,073	6,957
South Carolina	2,923	1,495	1,644	5,310	2,754
Georgia	4,393	2,949	2,955	8,538	7,264
Florida	2,375	2,718	2,552	6,713	5,790
Total South Atlantic	29,459	23,103	19,788	59,643	46,372
Kentucky	4,103	2,551	2,381	8,169	4,943
Tennessee	5,087	3,493	2,351	9,238	6,918
Alabama	3,909	3,482	1,795	6,888	6,425
Mississippi	1,643	1,197	827	3,089	1,928
Total East So. Central	14,742	10,723	7,354	27,384	20,214
Arkansas	2,299	2,008	1,355	4,716	3,581
Louisiana	3,060	2,301	2,224	6,794	4,674
Oklahoma	3,608	2,885	2,403	8,316	6,294
Texas	11,636	8,165	7,253	24,565	19,429
Total West So. Central	20,603	15,359	13,235	44,391	33,978
Montana	1,208	669	990	2,685	1,501
Idaho	1,730	858	1,099	3,396	2,061
Wyoming	418	357	329	889	754
Colorado	2,162	2,052	1,274	4,441	4,422
New Mexico	618	491	442	1,311	1,050
Arizona	1,570	881	969	3,030	1,914
Utah	1,976	963	2,003	4,414	1,985
Nevada	315	176	337	840	419
Total Mountain	9,997	6,447	7,443	21,006	14,106
Washington	4,025	4,326	3,103	10,850	8,592
Oregon	3,385	1,893	1,558	7,378	5,099
California	22,864	12,556	16,648	49,322	27,990
Total Pacific	30,274	18,775	21,309	67,550	41,681

Figures based on report by the National Electrical Manufacturers Association E.E.I. 4-30-36

Pittsburgh Electric Power Supply During the Recent Flood

By E. C. Stone

Assistant to the president, Duquesne Light Company

THE official crest height of the recent great flood was 46.2 feet, which was the maximum reached since 1907 when a height of approximately 38 feet was attained. Prior to this recent flood, the 1907 flood was the highest recorded within the operating experience of the electric utility systems in the Pittsburgh district. Studies made after the 1907 flood indicated that the conditions prevailing at that time were not only unusual but represented near the worst that could be reasonably expected in the Allegheny and Monongahela water sheds. Power plants built in this district since 1907 were designed to withstand flood levels materially above the 38 feet level of the 1907 flood but did not contemplate the extreme crest reached this year. Nevertheless, Duquesne Light Company was able to keep its Colfax plant in operation until 3:56 p. m. on March 18, at which time the flood was within approximately one foot of its final maximum crest and seven feet above the 1907 level.

The flood first reached threatening heights on the evening of Tuesday, March 17, and by midnight of that day showed a crest of 36 feet. Although during the night several of our customers were disconnected by their own request, the system as late as 4 a. m., Wednesday, was carrying a greater load than it had carried at the same time on the previous night. On the following morning, however, the peak was only 175,000 kw, compared with a peak of 275,000 kw on the previous morning, and this loss of load was a measure of the extent to which the high flood levels then reached were interfering with the industrial and commercial activities of the district.

As the water levels rose and submerged electrical equipment, it was necessary to cut off the power supply in order not only to save the equipment from destruction but also to prevent possible loss of life which might have resulted from contact with wet energized equipment. Except in the downtown vaults where submersible equipment was installed, the rising water forced oil out of transformers and circuit breakers, put protective equipment and meters out of service, and rendered useless practically all apparatus so exposed. The major portion of the electrical system, however, was kept in service until the shutdown of the Colfax plant.

With the power system thus completely shut down practically all industrial and commercial activities in the great metropolitan area of Pittsburgh came to a standstill, thus very vividly bringing to the 1,300,000 people in the area the tremendous importance of electric power in our modern life. A great emergency was thus created.

In this emergency there were obviously two major situations to be met by the Duquesne Light Company. First, the reestablishment of service as rapidly as possible to those customers not affected by the flood, and second, the rehabilitation of the power plants, substations and lines that had been put out of service. As soon as the onrush of the waters gave evidence of a possible shortage in power supply, plans were instituted to secure power from the surrounding utilities through the interconnections. The generous cooperation of the West Penn Power Company and of the Pennsylvania Power and Ohio Edison Companies, all of which were also suffering severely from flood conditions, made a

Special flood issues of the company magazines of a number of utility organizations operating in the districts affected by the heavy March floods have been published. Carrying numerous photographs, vivid descriptions of the devastating periods, and all too modest accounts of the frequently heroic work of the employees in keeping and restoring service, these magazines are of extraordinary interest. Flood issues that have reached this office so far are:

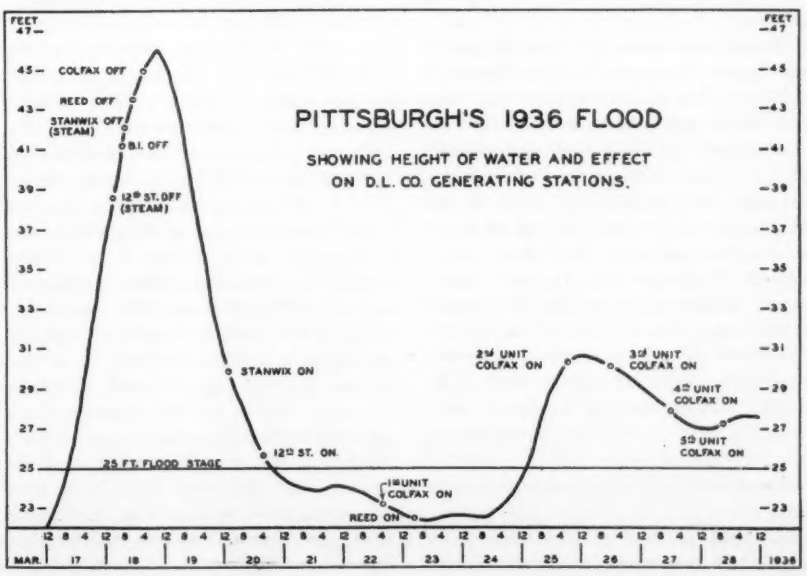
Public Service—published by the Philadelphia Company, Pittsburgh, Pa.—R. S. McCarty, Editor.

West Penn News—published by the West Penn Companies, Box 1736, Pittsburgh, Pa.—H. S. Metcalfe, Editor.

U G I Circle—published by The United Gas Improvement Company, 1401 Arch St., Philadelphia, Pa.—Gordon M. Jones, Editor.

The Illuminator — published by The Hartford Electric Light Company, Hartford, Conn.—Elsa Erlanson, Editor.

It is possible that extra copies may be available from the editors.


PITTSBURGH'S 1936 FLOOD
SHOWING HEIGHT OF WATER AND EFFECT ON D.L. CO. GENERATING STATIONS.
FEET
COLFAX OFF
REED OFF
STANWIX OFF (STEAM)
B.I. OFF
12TH ST. OFF (STEAM)
STANWIX ON
12TH ST. ON
25 FT. FLOOD STAGE
1ST UNIT COLFAX ON
REED ON
2ND UNIT COLFAX ON
3RD UNIT COLFAX ON
4TH UNIT COLFAX ON
5TH UNIT COLFAX ON
MAR 17 18 19 20 21 22 23 24 25 26 27 28 1936

substantial power supply available to us very shortly after our own power supply gave out.

In this situation it was of prime importance that the health and safety of the people be given first consideration, hence a priority order was set up in accordance with which service should be reestablished as follows:

1. Communication systems, including police and fire signals, telephone and telegraph.
2. Service essential to the preservation of life and health, including water pumping, hospitals, dairies and other food supply concerns.
3. Street lighting and limited transportation service.

Communication was given first priority because it was obviously so essential to the restoration of all other activities. The reasons for giving priority to the service essential to the preservation of life and health are self-evident. Street lighting was obviously necessary in the interests of preserving law and order and to prevent looting, and limited transportation service was required to bring the majority of the rehabilitation workers to the flooded areas. After these essentials were taken care of, the remaining domestic, commercial and industrial service was restored as rapidly as possible.

Before the shutdown at Colfax, the first emergency power supply was obtained through a 22-kv tie-line with the West Penn Power Company at McKeesport. This first supply, which was limited by the capacity of the line to a small amount of power, was used primarily to establish communication service in accordance with the priority schedule.

The transmission route established by the System Operator for the delivery of this service is of interest. Starting from the McKeesport substation, energy was transmitted to the Dravosburg substation at 22 kv, stepped up to 66 kv, fed through the high-tension ring to the Woodville substation, stepped down to 22 kv, transmitted to the Chess substation in the South Side, further stepped down to 11 kv, and thence fed into the Grant substation on Second Avenue. At this point it was put into a network feeder which carried it to the Bell Telephone plant on Seventh Avenue, thereby enabling them to recharge approximately 50 per cent of their batteries and so establish limited telephone communication.

A small portion of this first power supply was transmitted to Brunot Island and Colfax in order to provide service necessary in connection with rehabilitation. An interesting sidelight in this connection was the fact that all switching in the Colfax yard had to be done from a boat, fishing down in the water to find the tripping mechanism of the oil circuit breakers. Although the Pennsylvania Power Company had previously promised a supply of power over the interconnection at our Valley substation in the Beaver district, interferences with telephone service at the time made it impossible for the System Operator to make arrangements for utilizing this source. Realizing the situation, the substation supervisor at Valley, after trying to get in touch with the System Operator through practically every Bell exchange in and around Pittsburgh, finally obtained a communication with Springdale, from which he could be connected with our Colfax plant and then in turn over a company line to the System Operator. Thus another source of power supply was obtained by interconnection and used for additional supply to the essential requirements.

About noon the following day, the operators at Colfax were able to perform manually the switching necessary for the reestablishment of the high voltage interconnection between Colfax and the West Penn system. With this source of supply available, a total of 20,000 kw was being fed into the system. This power came from seven different sources and it was necessary to operate the system in seven independent units, none of which could be paralleled because of different voltage and frequency conditions.

A very difficult and complicated problem was involved in distributing the available power to the points designated in the priority schedule. The priority customers were scattered over many distribution circuits which served also many other customers. Thus it became necessary to disconnect all non-priority services from the major distribution circuits so that when they were restored to service the amount of power taken would be held within the available limits. As more power became available and the necessities for reestablishment of service became more urgent, this task of adapting the circuits to the emergency requirements became tremendous. Nevertheless, practically all customers on the priority list who were in a position to use service were receiving it within thirty-six hours after the system shut down.

Under these conditions the problem of coordinating load and capacity was a most difficult and complicated one. In this work the System Operator utilized the services of the System Planning Department. Curves were prepared of expected loads by classes of customers, in accordance with lines and capacity available. A daily load curve for each class of customer was then prepared and the sum of these curves showed the total daily available load. This was used to form a reliable estimate of how much of the system capacity could be assigned to each class of customer. In this way available capacity was utilized to the fullest extent and for only two short periods was it necessary to dump load after service was restored.

Concurrently with the emergency distribution of power by the System Operator, the work of rehabilitation proceeded. The first step was to develop a definite plan for carrying on. Every available employee was commandeered by the operating organization. Each department designated certain experienced employees as work dispatchers and through them the specific jobs were assigned, progress was reported, and coordination between departments maintained. Engineers in various non-operating departments were organized into emergency construction crews. Other employees were assigned to police duty and a special corps of messengers was created in the absence of telephone communication. Many messages were delivered to inundated substations by means of boats or temporary rafts rigged up by ingenious employees. Other employees were assigned to handle the requests for information made by hundreds of people who called in person at the company's building, while others were assigned to handle thousands of telephone inquiries which poured in after the restoration of telephone service.

In order to facilitate the work of the emergency rehabilitation crews, special arrangements were made with the William Penn Hotel and others to provide meals, the restaurant facilities at Manchester were greatly expanded and arrangements were made to serve meals at the power stations. Sleeping quarters were provided both in the hotels and in the central office building. Many of our employees did not see their homes for a week or more after the flood started.

On account of the general water situation it was necessary to provide supplies of drinking water for the flood

workers at a number of points. Under the supervision of the Stores and Personnel Departments some ten thousand gallons of pure drinking water were delivered throughout the flood district.

This was only one element in the transportation problem created by the rehabilitation requirements. Of the 633 units normally maintained by the Equitable Auto Company, 17 were put temporarily out of commission. Some 85 additional trucks and passenger cars were pressed into service. In order to assure gasoline supply, arrangements were made on March 18, when the shutdown became imminent, to fill all gasoline storage tanks, thus making available 20,000 gallons of gasoline for emergency use. During the three-day period when no pump service was available a special trucking drum service was established to keep all vehicles supplied in fuel.

Other emergency provisions included compressed air supplies by truck-mounted air compressors, a portable gas engine driven generator set for generating electrical power, and supplies of batteries for temporary lighting to various departments, particularly for telephone service.

Provisions were made as rapidly as possible to pump out flooded power stations, substations, vaults and manholes. For the purpose fire engines were obtained from various municipalities and gasoline and oil engine pumps were purchased, borrowed, or rented from any available source.

Arrangements were made for drying and reconditioning vital electrical equipment at the Colfax and Brunot Island stations and in the Manchester shops. Temporary emergency ovens heated by steam radiators were installed to give temperatures of from 140 deg. F. to 240 deg. F. for that purpose. Orders were placed for almost $1,000,000 worth of wire, lead covering, cables, meters and other essential items, and within ten hours after the shutdown two carloads of repair equipment from the New York Edison Company and Philadelphia Electric Company were en route to Pittsburgh by special trains. Included in these shipments were complete line and cable testing equipment to be used in place of the company's equipment which had been made useless by the water. Much of the smaller material for rehabilitation came by trucks while some was brought in by aeroplane.

The damage to the power system equipment included both mechanical damage caused by the force of the moving flood waters and electrical damage to the insulation of flooded equipment in the stations and substations.

At Colfax the bulkheads held but water entered the generator air ducts and flooded the basement. None of the main generating units was affected, but the motors operating the turbine auxiliaries in the basement were put out of business and considerable damage was done to the piping system. The outdoor switch yard was submerged to a depth of 3.5 feet, as a result of which the electrical control system to the switch yard was rendered inoperative.

On Brunot Island very little water got into the basement of the Reed plant so that little damage was done there, but in the adjacent switch house, from which power is distributed to practically the entire business district of Pittsburgh, the flood rose above the cable potheads and put practically all of the outgoing feeders out of business. At the Brunot Island power station the flood reached the windings of the main generator units. At the crest the entire surface of the Island was submerged by several feet of water.

The work of the divers was of outstanding importance in rehabilitating the power stations. They descended manholes, hot wells and other parts that were under water in order to make inspections, to remove equipment or to operate valves, thus greatly facilitating the task of rehabilitation.

Fourteen distribution substations were in the flooded area and suffered damage to some or all of their electrical equipment. At the Lawrence substation the water level was 16 feet above the regulator floor. At the Neville Island outdoor station it was 12 feet deep in the station yard. At Stanwix the water was 9 feet deep on the main floor and at Manchester 6 feet deep.

In these stations 38 rotating machines ranging in sizes between 200 and 8000 kva were put out of commission due to flooding of the machines themselves or their accessory equipment. Twenty-six induction regulators and 40 street lighting transformers were also submerged.

Forty-one high-tension customer substations were flooded. Fifteen of these were under 10 feet or more of water, while in one the water level was 20 feet. In 20 other stations the water was between 5 and 6 feet deep. Twenty-seven low-tension customer substations were also flooded. Some of these, located in the subbasements of downtown buildings, were under as much as 50 feet of water.

Of these stations, 71 were damaged to the extent that it was necessary to entirely recondition the circuit breakers, change the oil, and in many cases retape the bushings. It was also necessary to replace 85 high-tension transformers and 104 low-tension transformers ranging in size from 5 kva to 666 kva, and having a total capacity of 39,083 kva.

Over 2000 power-type meters and over 10,000 house-type meters were under water and had to be replaced.

Practically all of the overhead line structures in the flood area were subjected to collision with numerous floating articles, some assuming the proportions of houses, tanks from tank cars, and other massive structures. In some cases the poles were broken and in others the wires were whipped together and burned down. In other cases the scouring action of the water practically washed out the ground around the butt of the pole or the concrete tower footings, thus permitting a complete collapse of the structure. Sections of pole lines up to nine spans were found lying on the ground, only held from floating away by the conductors and guy wires. A 66,000-volt river crossing tower on Brunot Island was undermined and toppled over. The submarine crossing manhole on the upper end of Brunot Island was so badly damaged because of a washout affecting the supports for the aerial cable between the crossing and the power station that eight trunk transmission cables were put completely out of service.

The pole yard and underground headquarters at Reedsdale Street were submerged some 8 feet. At Bridgewater the distribution headquarters was under 8 feet of water, and an entire building some 18 by 28 feet, filled with household furniture, was left deposited in the driveway.

A major portion of the low-tension distribution network in the downtown district was of course completely flooded. All of this equipment was of the so-called subway-type waterproof construction, and it was especially gratifying to find on inspection, just after the flood had receded, that very little damage had been done to the equipment and cables in this system.

Obviously, it was necessary to exercise great care in putting submerged electrical equipment back into service. Careful consideration had to be given in every case to the customers' wiring and

equipment as well as to that which was a part of the power system. In each customer's substation or installation affected, the wiring and equipment was checked out step by step. Each item was cleaned and then dried out and reconditioned or replaced as circumstances might require. As soon as an operating unit had been put in shape, the fact was reported back to the work dispatcher in the interested department. The work dispatcher then notified the System Operator that the equipment was in shape, after which service was restored as soon as power was available and proper clearance had been obtained for all of the lines and stations involved in each particular case.

The electrical inspection department of the city of Pittsburgh and the Allegheny County Board of Fire Underwriters cooperated with Duquesne Light Company in making the necessary inspections of customers' wiring and equipment and in setting up regulations whereby the company would be notified as soon as each installation was safe to be re-energized.

Before any circuit-feeding customer installations in the flooded area could be restored to service, it was necessary to disconnect all customers and metering equipment. As this was done, the individual circuits were re-energized one by one and the customers reconnected as rapidly as the inspectors' approvals were obtained.

It is especially gratifying to report that not one serious service accident occurred during the whole emergency period. This achievement seems all the more remarkable when it is realized that much of the work had to be done in wet places in the vicinity of energized equipment, that operations were hampered by interruptions to telephone communication, that in many cases adequate means of testing were not available, that the work was carried on at maximum possible speed and that some of it was done by extra employees not always acquainted with the rigid safety precautions required of regular company employees.

Many questions have been raised as to the practical value of the so-called management and engineering organizations in serving the operating companies. Our experiences in the recent flood vividly demonstrated the value of such an organization. During the crisis the Chicago office of the Byllesby Engineering and Management Corporation immediately responded. The vice-president in charge of operations, the chief operating engineer and the mechanical operating engineer were personally on the job assisting local executives in the administration of flood recovery. The purchasing department in Chicago operated 24 hours per day assisting the local purchasing organization in securing essential material. The engineering organization, both through its highly trained specialists from the Chicago office and through its Pittsburgh branch, assisted materially in expediting the rehabilitation of our system.

On Sunday, March 22, at 4:10 a. m. the Colfax 3-B 30,000-kw unit was put back into operation and from this time the restoration of service was rapid. On Monday at 5:15 a. m. the 60,000-kw unit at Reed was put in operation. The other units at Colfax followed in quick succession, so that by Thursday, March 26, just eight days after the complete shutdown, the system was able to meet all demands for power that were made upon it.

During the week thereafter, Pittsburgh resumed nearly normal business activity and as soon as customers could clean their basements of water and mud, dry out their electrical equipment, and obtain the approval of the city inspectors, their service was restored. In a large number of cases, customers were forced to rewire parts of their buildings and to purchase new electrical equipment. Since the flood, the system load has been increasing rapidly and so far for the month of April has run 20 per cent ahead of last year, which compares with a forecast made prior to the flood of 10 per cent. Undoubtedly much of this demand for power reflects industrial activity stimulated by the rehabilitation work resulting from the flood.

It is interesting to report that the company came to the assistance of the three municipally owned systems in the district as soon as they were able to utilize emergency power. To supply the borough of Etna, it was necessary to install a three-to-two-phase transformer bank on the property of the Spang-Chalfant Company. In Aspinwall, a 4-kv line extension was constructed from a circuit on Fox Chapel Road. In Sharpsburg, service was established through a regular emergency line provided for such purposes.

In closing, let us consider for a moment whether any lessons can be learned from these experiences with a record-breaking flood. Flood data are on record since 1763 and within this span of 173 years the nearest approach to the recent crest of 46 feet was a height of approximately 41 feet which occurred in only one year. With these exceptions a crest as great as 40 feet has never been reached. The flood damage in western Pennsylvania this year is estimated at between 100 and 200 million dollars and it is probable that three-quarters of it was done after the river had risen more than 40 feet. We as a community are therefore confronted with the very real problem of how much we can afford to spend to prevent a disaster of this magnitude which may occur less often than once in 100 years. Similarly, the utility companies must ask themselves whether their consumers are willing to pay higher rates in order to be assured of service during an emergency which may occur only once in more than 100 years. It is not necessary to point out that power plants must be located along rivers in order that ample supplies of condensing water may be available and that both the cost of constructing and operating these power plants will increase as the operating level is raised. These economic problems must be given very careful consideration.

The engineers of Duquesne Light Company are making a thorough and detailed study of the entire situation with a view to determining what reasonable steps may be taken to provide additional insurance against a repetition of the flood levels recently reached. Our customers may rest assured that everything will be done that can be done without imposing unreasonable burdens upon them in their rates for service.

In the recent flood the interconnections between power systems which made it possible for Duquesne Light Company to obtain sufficient power to maintain the essential life of the community when its own plants were shut down, appear to have been the most effective insurance against the flood. Practically all of the power plants in the water sheds of the Allegheny and Monongahela Rivers were partially or completely shut down. Interconnections, however, made it possible to utilize generating capacities located outside of the flooded areas and in some cases far distant from the Pittsburgh district. This recent experience is another important justification for the well-established policy of power companies to interconnect their systems through transmission lines of substantial capacity, and possibly suggests the most practicable method of insuring the power supply against future floods.

New Ventures in Better Light-Better Sight

By Merrill E. Skinner

Assistant Vice-President, Niagara Hudson Power Corporation, and Chairman, National Better Light-Better Sight Bureau

An address given at E.E.I. Sales Conference at Edgewater Beach Hotel, Chicago, March 25, 1936

THE Better Light-Better Sight activity has now attracted such favorable public attention that it has reached the stage where the iconoclasts are attempting to disparage it. Any activity which has its foundation based on facts need not be concerned with such criticism and we propose to go forward confident in the knowledge that our facts are unchallenged and that those of the public who follow our advice are universally delighted with the results. The criticism recently leveled at the Better Light-Better Sight activity emphasizes the need, however, for three things:

1. We must have continued research to expand the body of facts on which our program rests and to develop new data.

2. We must be certain that our sales story is a clean-cut one based upon these facts and not including unwarranted exaggeration.

3. We must repeat and emphasize and finally convince those who doubt our facts or the benefits of our program.

It is hardly necessary for me to demonstrate to this group of public utility people the advantages which have accrued to our industry through this promotion. I have just seen advance proof of the latest tabulation available on the shift in demand for incandescent lamps of various sizes. The figures for the last year are as follows:

Lamp Size	% 1935	% 1933	Change in % of total lamps sold
10 watt	2.1	2.7	− .6
15 "	7.1	7.9	− .8
25 "	15.7	16.9	−1.2
40 "	10.9	10.3	+ .6
50 watt*	*	8.9	—
60 "	21.9	22.2	− .3
75 "	4.9	3.7	+1.2
100 "	9.2	7.7	+1.5
150 "	3.2	2.5	+ .7
200 "	2.9	2.7	+ .2
300-1,500 "	1.2	1.0	+ .2
All others	20.9	13.5	—

* Included in "all other" classification in 1935.

It is interesting to note that below 40 watts all sizes showed a reduced percentage in comparison with the total of the number of lamps sold, whereas from 40 watts up every size showed an increase except one.

These figures of percentage are small, but when they are multiplied by the millions and millions of incandescent lamps sold in this country each year they assume more important proportions.

Up to the present time the Better Light-Better Sight activity has been thought of principally as a home lighting activity. I think this was because commercial and industrial lighting promotion has been practiced effectively by the public utility companies for many years, whereas it was not until our Better Light-Better Sight program got under way that we found ways and means of efficiently reaching the home market. The home market is, of course, the key to all others, for wherever people work or do business they still all live in homes. And if they accept the Better Light-Better Sight principles in the lighting of their own home they are found to be influenced in their appraisal of lighting in offices, factories, schools and wherever they work. We feel that, without in any way diminishing our interest or our emphasis of the home lighting market, the time is ripe to direct more of our attention to other lighting fields and that the principles of the Better Light-Better Sight movement can very properly at this time be extended to the school, commercial, industrial and to the street and highway lighting fields.

School lighting is an obvious outgrowth of home lighting, for our approach and emphasis to the latter market has been based principally on the appeal of child welfare, and school work represents a large proportion of the eye work of children. The resistance which we will encounter is not so much due to any questioning of the facts which we have at our disposal but rather to the unyielding limitations of municipal budgets. These limitations are embarrassing to school authorities and we must remember the position in which they find themselves and be sympathetic. Nevertheless, a proper realization of the importance of school lighting might well result in directing funds, which would otherwise be used for other less worthwhile phases of school operation, to the important question of lighting. We must also remember that school authorities of necessity are on the defensive due to these budget limitations and we must be prepared to vigorously support our contentions with real facts. We need lighting installations which are tailored to the seeing tasks performed in the specific rooms. We need data to show that daylight cannot be relied upon and the number of hours during which artificial lighting is absolutely essential. We need research work to establish more accurately the lighting levels required by seeing tasks of various types. I sincerely hope that out of a greater use of the visibility meter which was made available for the first time this past year some basic research can be accomplished in this field.

In the commercial field many office managers are being importuned by their employees to improve the office lighting. Having experienced improved lighting at home, people are now conscious of the fact that it is just as important to have good light to work by as it is to have good light at home to read or perform other seeing tasks during hours of leisure. The principal resistance which we will encounter is due to the cost of rewiring which is encountered in many instances. I can recall that when we started the Better Light-Better Sight Bureau the contracting fraternity, while they felt sympathetic to the objectives of the Bureau, were somewhat skeptical as to the extent to which this promotion would benefit their group. I think the number of cases where commercial lighting installations have required substantial changes in building wiring have now

produced ample testimony as to the benefits accruing to them. I want to emphasize the importance of having courage; of offering recommendations which we know are those which should apply rather than compromising and shading our own judgment due to the reluctance of our prospect to spend money enough to accomplish proper lighting results. In many instances we are now going back to customers who several years ago accepted the recommendations which our own companies offered and they now properly ask—"We put this lighting installation in as you suggested. Why didn't you tell us then that it was not sufficient and that in a few years we would need to revamp it?"

In the industrial field I believe that we can probably utilize a new approach which is based upon the fundamental cooperative nature of the Better Light-Better Sight movement. Factory managers hire employees because they need their hands and heads. But these employees need their eyes to guide and direct their hands. In order to work properly they must have not only good vision but also proper light tailored to meet the requirements of the individual seeing tasks. To get this light most economically, the reflecting surfaces must be efficient. It is my belief that an industrial manager will respond more readily to a request for a "Seeing Survey" in his plant than he will for a corresponding request for a lighting survey. In cooperation with the optical and paint group it should be easily possible in any locality to work out recommendations which, if followed by the factory manager, would assure him of the best possible seeing conditions in his plant. We know that this would pay him excellent dividends.

At the present time there is a tremendous amount of public interest in the question of safety. Newspapers are full of comment in regard to the tragic toll of traffic accidents. Not quite so spectacular but equally as tragic are the accidents occurring in homes. The Better Light-Better Sight Bureau is thoroughly alive to the important relationship between ability to see danger and ability to avoid it. As Chairman of the Bureau I attended Secretary Roper's Conference on Safety held in Washington in December and subsequently a statement was submitted to the Chairman of the subcommittees appointed at that conference from which I would like to quote briefly as follows:

"There are four fundamental steps in the process of avoiding danger, which may be classified as—

1. Visual.
2. Mental.
3. Physical.
4. Mechanical (assuming that the danger is from a moving vehicle or piece of machinery).

"The sequence of these steps is self-evident, as one must first see the danger before any steps can be taken to avoid it.

"The next step is for the mind to formulate the action needed to avoid the danger after which come the actual physical movements necessary to escape it. In the case of a moving vehicle or of moving mechanical parts there is also involved the question of how the vehicle or machinery will react to control and the time interval necessary for mechanical operation.

"It must be obvious that *seeing* is the origin of all safety work and, therefore, is of paramount importance."

Street and highway lighting is important as an accident preventive because it helps us see better, but it is not a panacea for all highway accidents. Fifty-eight per cent of all the traffic accidents in 1935 occurred during daylight hours. It is important in advancing the merits of highway lighting as an accident preventive that we keep this clearly in mind. This point was recently stressed by Mr. Earl J. Reeder, Traffic Engineer of the National Safety Council, in a plan presented before the Street Lighting Committee of I.E.S. on November 18, 1935.

He said:

"There can be no doubt that good highway lighting can and does, in general, reduce accidents. Obviously, however, this result is possible only where, in the absence of good lighting, accidents of a type which such lighting will prevent, have occurred or will occur. Traffic engineers are primarily interested in highway lighting only where substantial accident reduction, or where necessary reductions in congestion are made possible by it.

"Street and highway accidents are not evenly distributed. They are not even distributed in proportion to the traffic volume. Various circumstances make one intersection or one section of roadway accident prone while other locations, many times outnumbering these high accident ones, have few accidents, if any.

"Traffic engineers have learned that there is no better argument for any desired restriction or equipment, no argument that will make the money which it will cost more readily available, than the argument that it will prevent the kind of accidents which are occurring at the point for which it is proposed. The same thing will hold true in the field of street and highway lighting and if traffic engineers appear to be extremely conservative in this field, it is because they have not yet had defined for them, and have not yet discovered for themselves, the critical points at which highway lighting is necessary for substantially reducing accidents or congestion."

Obviously it will be necessary for us to marshal more data, particularly field research, to show effectively and quantitatively what can be accomplished by correct highway lighting. Let us not forget that safety in the home is almost if not quite as important as safety on streets and highways. The same arguments in favor of Better Light for Better Safety apply in this field. Other agencies are rapidly taking up this theme and will be of great assistance in bringing this story to public attention. I recently saw a copy of a publication, "Live and Let Live," by the Travelers Insurance Company of Hartford, Connecticut. Not only does it contain a very comprehensive analysis of 1935 traffic accidents but also includes in cartoon form illustrations which drive home the lessons which may be learned from these statistics. On page 31 it says:

"There is no way to explain the high rate of death per accident at night except by the admission that many operate at speeds which do not permit them to stop within the range of illumination provided by headlights. Under such conditions lives are crushed out whenever the unexpected happens. Either highways must be illuminated and the lighting of streets improved or some definite check must be placed upon a car's potential speed after darkness.

"A rate of death per accident for the normal hours of darkness fifty-nine per cent worse than during daylight should focus attention on the conditions and conduct of drivers and pedestrians responsible for such a record after sundown."

Perhaps we might think it strange for a Bar Association to take an interest in this question, but traffic accidents are frequently a source of litigation and a committee of the New York State Bar Association was recently appointed to consider the subject. Their report, presented at the fifty-ninth annual meeting in January, 1936, contains six recommendations, of which two are particularly interesting to us:

* * *

"Second, adequate street and highway lighting."

* * *

"Fourth, the passing of a physical examination showing fitness to drive should be required following conviction of a moving traffic violation resulting in an accident or upon the failure to pay a judgment for money damages arising out of a motor vehicle accident."

In my personal opinion this does not go far enough. We should examine the eyes of everyone before they are allowed to drive a car.

I would like to recommend that we enlist the interest of our own Safety Departments in this problem. They are not only actively interested in the prevention of accidents among our own employees but they have a broad interest in community safety work and have a wide contact with all engaged in this field.

And now a few words for the I.E.S. Better Sight lamp program. Starting with a single model, namely, the study and reading lamp designed for students' dormitory rooms, this program has gradually evolved to meet field needs. The specification and certification procedure was gradually extended until now we have the following types of lamps included:

Table Study and Reading Lamp.
Junior Floor and Lounge Lamp.
Bridge Arm Lamp.
Wall Mounting Study Lamp.
Clamp-on Model Study Lamp.
Semi-Indirect Utility Floor Lamp.
Full Indirect Utility Floor Lamp.

Several of these types are manufactured to accommodate double filament lamps either 50-100-150 or 100-200-300 watts. I am happy to say that the Illuminating Engineering Society is just ready to announce a specification for an end table living room lamp. This will go a long way to fill present needs in the field and I am sure will win to this program a very much greater measure of support from the department stores, home furnishing stores and others who are important factors in the marketing of floor lamps.

Beginning on January 1 separate tags are being provided for the base and for the shades. This permits the two elements of the portable lamp to be purchased from different sources if it is so desired; takes care of the replacement problem; generally simplifies the procedure for all involved in the merchandising operation. As of March 21, forty-five manufacturers were actively cooperating in the program. This is a reduction from the peak of sixty who were cooperating at one time last year. Some of the very small manufacturers have dropped out of the picture, but every large important manufacturer is cooperating. On the aforementioned date, there had been a total of 1,119,407 base tags issued to manufacturers and, in addition, since the first of the year, a total of 107,523 shade tags.

The cooperative advertising campaign being carried on by General Electric, Westinghouse, and the portable lamp manufacturers is continuing and based upon the increased production contributing to this program in 1936 it is estimated that the total amount of this advertising will be almost doubled. A folder will be available shortly showing samples of the advertisements which will be utilized as well as a small folder which is used in response to inquiries. This same folder will not only be used by both Westinghouse and General Electric but also by all of the cooperating portable lamp and shade manufacturers and may be utilized by utility companies if they desire.

"OWED TO YOUR EYES"

A Sound Slide Film production now available, incorporating some of the important and broad aspects of

LIGHT AND SIGHT

It is a presentation with plenty of human interest, highly educational and not too commercial.

130 pictures and illustrations – 20 minutes in length

Prepared for adult audiences, it will develop a new concept of Better Light for Better Sight in a smoothly running and entertaining manner.

The story is built around a typical American family—Father, Mother and two children.

The scenario opens with the family out for a walk and stopping to look at a window display featuring Better Light-Better Sight—care of the Eyes, etc.

The Mother, having been mildly interested in Better Light-Better Sight advertising, decides to investigate—to learn of the condition of the family's eyes, especially the children, and to find out what this "Better Seeing" is all about.

One of their friends is an eyesight specialist whom they visit on the way home. The Doctor not only enlightens them on the importance of eyes, the care and necessity of right environment for them, but goes through a brief examination demonstrating the new light prescribing technique now being adopted by eyesight specialists generally.

With the Doctor's light prescription, they follow through with his recommendation and call in a home lighting specialist. The scenes and script from then on proceed with the regular routine of lighting being checked, rearrangement and additions for proper lighting, redecoration, etc., concluding with evidence of that family having a better understanding of the value of their eyes and what to do to protect them.

Wide use of this Sound Slide Film will impress and develop new prospects for "Better Seeing." It will materially aid lighting and seeing specialists in promoting Better Light-Better Sight.

The Film fits any standard type portable projector (35MM). Sound is recorded on both sides of a 16 inch disc usable on any standard portable sound producing apparatus.

PRICE – For the combination of film and record – $10.00

Produced and distributed by the
National Better Light-Better Sight Bureau
420 Lexington Avenue New York, N. Y.

It is evident from a review of newspaper advertising that department and home furnishing stores are giving increasing attention to Better Sight lamps and to the proper merchandising of them. Recent illustrations are a folder issued by L. Bamberger and Company entitled "Better Light for Better Sight," and devoted exclusively to featuring I.E.S. approved lamps. A corresponding folder was issued by the J. L. Hudson Company of Detroit. Newspaper advertising is being generally used, as for example a large advertisement by Meyer and Frank Company of Portland, Oregon, devoted exclusively to the promotion of I.E.S. Better Sight lamps. The increasing extent to which the department stores are featuring approved merchandise in their lamp department is a very important indication of the increasing public acceptance back of this part of our program. It indicates how important it is that we utility men support the approval tag program 100 per cent and do everything in our power to advance the standing of the tag.

We continue to enjoy wonderful cooperation from other industries. Re-

cently a new setup has been effected which should materially advance and expedite the acceptance of the Light Prescribing Technique by optical practitioners. Mr. Earl Canfield will speak on this phase of the program this afternoon. Other evidences of cooperation include the recent addition of the International Society of Master Painters and Decorators as co-sponsors of the Better Light-Better Sight Bureau. Their first move was to send out to all of their clubs throughout the country a suggested program on Better Light-Better Sight and a resolution to be passed by each of these clubs endorsing the movement.

And so the enthusiasm back of the movement is growing steadily. Each addition to our ranks, each new activity lends just that much more to the effectiveness of your own efforts. I urge you to begin planning now for an extension of the Better Light-Better Sight activity into the additional lighting fields that I have mentioned. I urge you to check up on your company situation and see that we take our own medicine not only in the relighting of our offices and display rooms but also that we take the same medicine in regard to eye tests and repainting that we are recommending to others. Why not check up to see how many of our own employees need eye correction and what improvement in lighting we can affect in our own properties through a judicious use of paint? Sometimes without realizing it, we allow ridiculous situations to develop. I recently visited a public utility show room in which there was a marvelous display of Better Sight portable lamps. Probably more than 200 units were arranged in most attractive display. The fixtures providing the general illumination for the room were equipped with unshaded bare bulbs. Let's each of us go home and make sure this can't happen in our own situation.

Government Ownership

IF the past is any guide to the future, one must conclude that government ownership is unsuccessful no matter what pragmatic test is applied. If we can gain experience from foreign countries, we must say that there is no more pressing problem today than that created by the trend toward the entry of government into industrial enterprise. Once definitely embarked upon this course, there is no convenient place to call a halt.

Those who profess their desire for government ownership are of two classes. First, those who have an interest at stake, and therefore are predisposed. Second, those who, while physically mature, remain intellectual invertebrates and persist in their mother complexes. Childhood always leans on authority, and the state is the ultimate civil authority. The state knows nothing about operating a business, is not organized to carry on a business, and has been uniformly unsuccessful in operating business. Yet apparently all this in no way dims this group's belief in the omnipotence of the state and in its ability to straighten out all the affairs of the troubled economic world.—Robert Teviot Livingston in the *Independent Journal* of Columbia University.

Standard Mountings for "A" Meters

THE Meter and Service Subcommittee, E.E.I., has not to date made any definite recommendations as to a standard for mounting of "A" type meters. It was the consensus of the Committee that a thorough study should be made of this subject in an attempt to reduce the number of different methods.

In the latter part of 1935 information was received from eighteen companies which showed from the reports that a majority of these companies are using "A" type of meter. All companies who are using this "A" type of meter have some suitable and economical method of installing them.

In view of the fact that the "A" type of meters, being similar in mounting dimensions to previous types of bottom connected meters, are adaptable to practically all modern types of metal meter mountings and service entrance equipment and also that many companies are using suitable and economical methods of installing them; the Committee generally felt that no recommendations, definitely proposing a single standard of installing the "A" type of meter, seems to be necessary or desirable at this time.

Bank Official Reports on Resuscitation Job

The following interesting letter accompanied an application from the Mississippi Power Co. for an E.E.I. Medal for Mr. Howard. Mr. Howard will get the medal.

THE FEDERAL LAND BANK OF NEW ORLEANS

Hattiesburg, Mississippi.

MR. R. H. RAMSEY,
Mississippi Power Company,
Purvis, Miss.
Dear Mr. Ramsey:

Between four and five o'clock on the afternoon of September 17, I was driving out of Purvis, toward Hattiesburg, when I noticed a negro lying in the street, one block north of the Court House. The negro was unconscious and was holding a live wire with both hands. He first attracted my attention because of the smoke that came from the contact of the wire with his hands.

I turned around and stopped my car, then got out and looked for a dry stick with the idea of knocking the wire from his grasp. It had been raining and it was not possible to locate dry wood near the scene of the accident. At this time I saw a Power Company truck coming. Before the truck skidded to a stop, a tall red headed boy about twenty-four years old, whose surname is Howard, jumped out and jerked the wires loose from the negro. He proceeded to turn the negro over and began giving him artificial respiration. The negro's eyes were glazed, his mouth open and his tongue hanging out. I asked Howard if he had a pulmotor in the truck. He replied in the negative. I then proceeded to tell him he was wasting his time and that the negro was as dead as he ever would be. Howard replied: "Maybe so, but I am going to do my best to save him." I then got into my car and drove to Hattiesburg.

Last week when I was in Purvis, I saw the negro on the street. He seems to be allright with the exception he has lost some of his fingers on account of the accident.

I am of the opinion that some recognition should be given to Howard for the saving of the negro's life.

Yours very truly,
W. M. GRAHAM.

Commercial News Notes

Air Conditioning Statistical Service

THE air conditioning load in commercial and industrial establishments, and especially theatres, restaurants and department stores has been increasing rapidly in number and in size of installations. The status of this development as told by statistics on installation, has been the subject of many inquiries to utility companies from numerous sources.

Therefore attempt is being made by Edison Electric Institute to develop a statistical reporting service through member companies, so that quarterly reports of progress of installations may be issued.

It takes time to prepare such reliable statistical information. The basic reports of many companies must be built up from survey of the field. However, a start has been made, and Report Forms prepared by the Air Conditioning Committee have been issued to utility companies from the general office of the Institute. With the help of the utilities that are developing this load, a regular service can be inaugurated, and gradually built up for service to the industry.

Definition of Air Conditioning

Upon recommendation of the National Better Business Bureau and Federal Trade Commission a Definition of Air Conditioning was presented to the Institute for endorsement. It has already been approved by the Air Conditioning Manufacturers Association, American Society of Heating and Ventilating Engineers, and the American Society of Refrigeration Engineers. The Definition as formally endorsed by the Sales Committee at its last meeting in March reads as follows:

"Summer Air Conditioning should perform, as a minimum, the following functions:

1. Cool the air.
2. Dehumidify the air.
3. Circulate the air.

"Winter Air Conditioning should perform, as a minimum, the following functions:

1. Heat the air.
2. Humidify the air.
3. Circulate the air.

"Year-Round Air Conditioning should perform, as a minimum, the following functions:

1. Cool and dehumidify the air in summer.
2. Heat and humidify the air in winter.
3. Circulate the air.

"It is understood that the functions required by the season of the year are performed automatically and simultaneously to meet the specific minimum requirements of the user."

In order that there may be cooperation and coordination between the Air Conditioning Subcommittee of the Sales Committee and other Committees of the engineering groups, Mr. P. H. Chase of the Transmission and Distribution Committee and Mr. W. F. Sims of the Electrical Equipment Committee have been appointed as liaison members of the Air Conditioning Committee. This arrangement will provide a ready discussion of problems concerning air conditioning by the various divisions of the Institute.

Wiring

Chairman J. D. Noyes of the Wiring Committee has reported that a group of ten wiring manufacturers is now prepared to supply new simplified wiring material with a metallic assembly. The product as turned out by these manufacturers has been approved by the Underwriters Laboratories under a procedure which was arranged to take care of the situation. This new material will be available with a special label for special trial installation in limited territory. Mr. Noyes is optimistic that the material will be acceptable to contractors because of easy handling.

Attention is called to the Report on Steam and Electrical Requirements of Hotels which is available to member companies at 30c. per copy. This is a recent publication of the Industrial Power & Heating Committee.

A need has been expressed in the industry for a loose-leaf Handbook for salesmen including basic operating data having to do with power consumption. The Industrial Power & Heating Committee has this subject under advisement and is taking preliminary steps for the preparation of such a manual.

Radio Program—Better Light-Better Sight

The radio program—The Melody Master—sponsored by General Electric Company with a list of thirty-seven utilities operating in cities included in the Red Network has come to a close. This is the first program of its kind in our industry and the determination of another similar cooperative program to start this fall will be taken under advisement by a Committee headed by C. A. Tattersall, Niagara Hudson Power Corporation.

Commercial Cooking

An annual report of the Subcommittee on commercial cooking headed by B. M. Riker, Rockland Light & Power Company, has been completed and distributed. This report is available without charge to members upon request.

Convention Exhibit

Assembly Room No. 1 of the Auditorium at St. Louis, with entrances direct from the Assembly Hall, has been given over to a Commercial Exhibit covering the sales and promotional activities sponsored by Edison Electric Institute cooperating with manufacturers and numerous other associations. Promotional material in the four sustained programs will be on display. This commercial feature will be the only display at the Convention and the largest that has been attempted by the Sales group in the Institute.

Electrical Housewares

May 11 was the closing date for the Window Display Contest for Electrical Housekeeping Month. As the BULLETIN goes to press the Judges have not had time to come to a decision on the winners of the prizes which are trips to Havana with all expenses paid. "Goods well displayed are half sold" and it has been gratifying to note the marked improvement in window displays of small appliances over the past two years influenced by national and coordinated promotion by the Electrical Housewares Committee.

June is Electrical Wedding Month and thousands of attractive posters have been prepared and are now being distributed through manufacturer, wholesaler and utility channels to dealers of all classes in small appliances. This concentration should help sales volume in the small appliance lines for gifts for the Bride. The contest is based on the popularity of the Bride based on the number of gift votes which she receives. Each evidence of sale of an electrical appliance to the Bride will constitute a vote. A general review of this program by Mr. Steinmetz follows. — C. E. GREENWOOD.

Electrical Housewares Program

By H. P. J. Steinmetz
Chairman, Sales Committee, E.E.I.

EVERY Commercial Executive has followed the National Program to stimulate the small appliance market, first as the Table Cookery Program and now as the Electrical Housewares Program, whether or not he tied in actively with it. The Program is named Electrical Housewares to fit into the department store and other dealer concept of the small appliance classification. However, we do not include vacuum cleaners, washing machines, or ironers. Outside of the table cookery group, the main items included are irons, clocks, and mixers. The National slogan has been ELECTRIC TABLE SERVICE SAVES.

Now, there is a very good reason why we should not be content to have the small appliance market taken for granted. There are hundreds of thousands of small appliances in homes representing an investment of the consumer and they are not in use. Perhaps the idea of the service has not been sold or the appliance is obsolete or out of order. But obsolescence in itself is an important reason why we should sell this market. We have the new light weight irons with 1,000 watts capacity, toasters are automatic and waffle irons, too. There are roasters and casseroles that will do an efficient cooking job and make possible home-cooking in a few million homes where electric ranges, for one reason or another, cannot be installed.

Mixers are rapidly becoming a necessity in every kitchen and modern coffee makers result in these devices being used more hours in more homes. And finally the manufacturers are styling these devices so that they are more attractive to the purchaser.

The Housewares Program is supported by twelve manufacturers whose names are listed in all our advertising and promotional material. Edison Institute matches dollars with the manufacturer to carry on this Program.

This activity had its greatest momentum during Electrical Housewares Week last December when 75,000 Christmas posters were printed and distributed and were displayed in all classes of dealers' establishments from coast to coast. The results from this national coordination in actual sales obtained, and from the trade relations advantages, were gratifying to all those who participated and the Program has been extended for another year.

There will be four concentrations in 1936—National Electrical Housekeeping Month was in April, National Electrical Wedding Month is in June, National Electrical Buffet Serving Month will be promoted in October, and in December there will be promoted the Second National Electrical Housewares Week. The high spots in these concentrations are attractively designed posters which portray the theme of the activity for the month.

The poster for June is herein illustrated. It was widely distributed to utility commercial executives from E.E.I. Headquarters. The manufacturers have distributed it to their dealers, and orders are now being received for additional copies for those who wish to supply dealers. On the reverse side of this poster there are complete Terms and Conditions of a Contest built around a window display carrying the products of the cooperating manufacturers. Every window display must feature at least one of the posters. The Housewares Program has been emphasizing display—window and interior—because goods properly displayed are half sold.

It has been interesting to note the improvement in the displays that have been submitted in a series of contests over the past eighteen months. The idea of better display is being put across.

We have always divided dealers into three classes—departmentalized stores, utilities, and other dealers—for these contests, with prizes in each class. You will note that the winner receives a prize of a trip to Havana and three dealer representatives will have the pleasure of

one of these trips following the April contest.

Additional promotional material includes newspaper mats, single column and double column. This is effective copy and sells the idea rather than the product promotional. These can be obtained in single column or double column and the price is but 10c. to 20c. per mat. There is also a small mat with the reproduction of the poster which it is hoped dealers will include in the general advertising of their products.

There are also small stickers, reproductions of the poster, for stationery and packages. These are obtainable at $1.00 per roll, 1,000 in a roll.

The issues of *Electrical Housewares* will be information media about each concentration. That is, there will be one issue that will tell the story of the coming contest. The next month the issue will be the poster itself with the contest terms on the reverse side and the following issue will give the prize winners and stories of successful sales results.

Similar practice will be followed in subsequent concentrations.

A page advertisement will appear in *Electrical Merchandising* and *Electrical Dealer* announcing the Program to the trade before each concentration.

The outline of the complete program for the year has been prepared and distributed.

At the president time the circulation of *Electrical Housewares* is approximately nine thousand. Many utility companies are purchasing additional copies at $3.00 per 100 for distribution to local dealers to keep them interestingly informed on the development of this promotional activity. Our circulation should be at least 25,000 for a movement of this kind with its very definite merchandising possibilities and the splendid opportunity it offers for local cooperative promotion. We appeal to those who are now tying in to continue helpful assistance, and to those who have not been active we urge that you get better acquainted with the possibilities of the Electrical Housewares Program. It will be to our common benefit.

I seriously enlist your support for greater local interest and activity. Where we have had this support the results reported by utilities, wholesalers, and manufacturers indicate satisfaction to all.

Running Water Program

By P. H. Powers

Chairman, Electric Water Systems Council

THE subject of this report should be "five loaves of bread and two small fishes."

It seems unnecessary at this time to reiterate the value of running water as an influence on your rural load building problems and as a means of developing dealer cooperation in selling this rural business.

As most of you know, the initial program of the Electric Water Systems Council ended in 1935. This was an 18-month activity aimed at increasing the annual rate of electric water systems sales from 50,000 to 100,000. Actually, the sales in 1935 amounted to 108,000 so that the rate of sales toward the end of the year was probably greater than this. It is anyone's guess as to how much the Council activity contributed to this increase. Certainly, it must have had some effect.

The water system manufacturers were sufficiently pleased with these results to encourage a continuation of the activity and to finance the distribution of the booklet "Life in the Country" by the utility companies. In order to start this off, 10,000 sample booklets were prepared for distribution among the pump manufacturers and all of the important electric utility companies.

These sample booklets were sent to you with an outline of the plan and a suggestion that immediate requisition be made for your requirements. The water system manufacturers agreed to provide 100,000 booklets without cost to the utility companies for a trial distribution and have indicated a willingness to provide an additional quantity if the first distribution produces results.

One hundred nineteen utility companies have requested a total of approximately 221,000 of the booklets. Our problem has been to distribute 100,000 booklets against this number of requests. Therein lies the parable of the five loaves of bread and the two small fishes. A difference in this instance, however, is that having fed the multitude, there were not twelve large basketfuls left over.

It is so important to be able to measure the effectiveness of the use of these booklets that we have devised two means for its measurement:

The first is a system of coding the return postcards. Each supply of booklets sent to a utility company has a code number on the return postcard. In this way we will be able to tell exactly how many prospects return the postcards from each utility company area. Please, therefore, get your booklet into the hands of your best prospects only and don't dump any oversupply into some dark corner.

The second measure of effectiveness will be a sampling which we will ask each of you to undertake in order to spread the burden. This sampling will consist of personal contact calls on a representative number of the prospects to whom you have delivered the booklets. We will ask you to seek approximately the following information and report a summary of these findings to us:

Does the prospect recall seeing the booklet?

Was the return card mailed?

Has pump dealer made a sales contact or has prospect visited the dealer?

Has a water system been purchased?

Judgment of the person making contact as to whether the customer will be in the market for a water system during 1936?

A circular letter will be directed to each of the utility companies, participating in this activity, outlining this plan. I appeal now for your cooperation in obtaining this information because this will be a major determining factor as to whether or not we will be able to continue the distribution of these booklets.

To those companies whose supply has been curtailed and to those companies who have been late making their requests and, therefore, have received no booklets as well as to those who are not yet ready for participation but who may want to participate later in the year, may I now say that we are depending upon the enthusiasm and the aggressiveness of the companies distributing the first booklets to produce results sufficient to warrant a large supply of additional booklets being made available in the early summer. If this is done, I predict the sale of 150,000 electric water system units in 1936 and perhaps 200,000 in 1937.

Engineers Meet at Detroit

THE five engineering committees of the Edison Electric Institute ordinarily meet individually at times and places convenient for their work. It has been felt, however, that at least once in each year it is profitable for all of these committees to meet together in order to provide an opportunity for a more general interchange of ideas, for coordination of the questions that may be of interest to two or more committees, and to make the occasion profitable to chief engineers and other officials interested in the work of all the committees who may thus observe them all at work. Such meetings are "joint" meetings mainly in the sense that all of the committees are present at the same place and at approximately the same time. The meetings are staggered as well as possible over several days, but the schedules of the committees are customarily so full that there is little opportunity for more than the simplest form of general meeting in which all may participate, and sometimes these general meetings are omitted altogether.

Such a meeting was held in Detroit during the four days, May 10th to 13th inclusive. All five of the standing engineering committees held meetings and there were in addition meetings of the High Tension Cable Committee of the Association of Edison Illuminating Companies, of the manufacturers of power cable, and of a number of auxiliary groups upon special subjects. On this occasion there was also a most successful luncheon meeting on Tuesday, May 12th, which was addressed by Mr. Alexander Dow.

Altogether there were nineteen half-day regular sessions of the standing committees and six auxiliary sessions, counting as such stated meetings of six or more persons; these were held in the evenings, at breakfast or wherever they could be worked in. In addition, there were post-meeting inspection trips to the plants of the Detroit Edison Company, the Ford plant and other places of engineering interest. A little more than 250 individuals registered and the maximum attendance was considerably greater than this. Two of the committees held sessions on Sunday morning and afternoon because of other pressing engagements among their members.

The sessions of the committees were busy and fruitful. The Prime Movers Committee devoted a large part of its time to the timely subjects of superimposition and modernization of existing plant and to the pressing question of the behavier of metals at high temperatures. The Electrical Equipment Committee discussed the subject of bus protection and system reserves, in the latter case extending a discussion started at a prior meeting. This committee also devoted considerable time to the general subject of grounding. The Transmission and Distribution Committee devoted its sessions principally to high tension cable and material specifications, although notable papers were presented on sleet loading and weather records in connection with the operation and maintenance sessions. The Accident Prevention Committee further advanced its well-known program concerning the management aspects of accident prevention and the economic loss due to preventable accidents; this committee also discussed its statistical study of the cause and locus of accidents. The Hydraulic Power Committee completed consideration of a new report on penstocks to replace an earlier report now out of print for which there is a lively and continuous demand.

Beyond this, practically all of the engineering committees have at each of their meetings a standing amount of routine business, round-table discussions of operating and management questions, clearance of formal and informal reports, the administration of relations with other engineering organizations, standardization and similar subjects. These meetings are probably not spectacular, but they are certainly very industrious.

In addition to these subjects, all of the committees devoted considerable time at the Detroit meeting to discussions of the effects of the recent floods in New England and Pennsylvania. A very complete discussion was had, numerous slides were presented upon aspects of the floods appropriate to each committee, showing the effects upon generating stations, substations, bus and switching equipment, and lines. It is the custom in these engineering committees to adhere to a matter of fact—almost a prosaic presentation of any subject, but in spite of the best efforts of the various speakers to this effect, there emerged a story of engineering resourcefulness, of devotion to duty, and not a little veritable heroism which in all probability will otherwise remain unwritten.

—*Alexander Maxwell.*

Accident Prevention Committee

W. A. Buchanan, Chairman

SEVERAL subjects of interest to electric light and power companies in their safety and accident prevention work were discussed at the fifth meeting of the Accident Prevention Committee of the Institute held at the Statler Hotel in Detroit on May 10 and 11. Ten of the fourteen members of the Committee were in attendance. In addition several guests were present who were in Detroit to attend other meetings of the Institute's technical committees that met later in the week.

The final draft of the Report on Principles and Practices for Grounding had been distributed for comment about two weeks prior to this meeting. Earlier drafts of the report had been before the committee and most of the comments previously made had been provided for in the preparation of the final draft. A special subcommittee that was appointed to give careful consideration to a few suggestions for changes recommended approval of the report as distributed with the addition of one paragraph and such minor changes as might be recommended by other committees concerned. It was further recommended that one month elapse between the date of approval and the printing of the report.

The Cause and Locus study of employee accidents in the electric light and power industry which had been undertaken since the last meeting of the committee was reported on by C. R. Beardsley, sponsor of this work. The purpose of this study is to determine from power company records the conditions under which accidents had occurred, in order that the other technical committees might be advised of the accidents trend within their respective fields of activity. The results that had been obtained during the few months that this study has been under way were specially gratifying. A coverage of some 80,000 employee-years had already been compiled and constituted the first definite information the industry has had to indicate

the frequency and severity rates of the various classes and grades of employees. It was also decided that consideration be given to the modification of the form that is being used in collecting these statistics to make it suitable for use by combination gas and electric companies in furnishing information pertaining to accidents in their electrical operation.

Progress reports were made on several other subjects as follows:

Interlocks and Hold-off	—C R Beardsley for I W Gross
Low Voltage Hazards	—E W Gorry
Public Safety	—H J Burton
Employee Health	—Wills Machlachlan
Office Hazards	—E R Kropp
Traffic Hazards	—C N Rakestraw
Posters	—R M Godwin

In connection with the report on Low Voltage Hazards, Mr. Gorry presented a revised draft of the "Do You Know" pamphlet which had been rewritten, rearranged and given the title of "Your Silent Helper." This was approved with minor changes for publication and with the recommendation that everything possible be done to bring about an extensive distribution of this pamphlet among the domestic users of electric service.

Announcement was made of the issuance of a new edition of the Resuscitation Chart, 18 in. x 12 in. in size, which is now available at the General Offices of the Institute at the following prices:

1—10 copies to one address	$.10 per copy
10—100 " " " "	$.05 " "
100—100 " " " "	$.04 " "
1000 copies or more to one address	$.03 " "

The Chairman expressed regret over being unable to attend the group luncheon that had been arranged at which Mr. Alex Dow, President of the Detroit Edison Company, spoke. Unavoidable conditions had made it necessary to schedule the Accident Prevention Committee meeting on days which did not permit the members of this Committee to attend this luncheon.

STILL INJUSTICE

"There is still injustice in the world. I am being deprived of a steam yacht because the ship trust is keeping the price of yachts too high and besides it costs too much to run one. I suggest that the people of the Tennessee Valley be taxed to buy for me the yacht to which I am entitled. I was taxed for their cheap electric power. Turn about is fair play. Let a bill be introduced in Congress immediately. With the help of the Administration we'll sink the ship trust."—A. W. PARK.

Electrical Equipment Committee

W. F. Sims, Chairman

THE spring meeting of the Electrical Equipment Committee was held at the Hotel Statler, Detroit, Mich., May 11 and 12, in connection with the meetings of the other engineering committees of the Institute. In addition to about 25 members there were about 25 guests present at the meeting.

The morning session was a closed meeting where items of procedure and plans of the committee were reviewed. The report on apparatus and system failures was presented and some of the outstanding items were reviewed in detail. The revised form for reporting oil fires was presented and approved by the committee. A moving picture film showing experiments conducted to determine the best method of extinguishing transformer oil fires was presented.

Mr. Buchanan, Chairman of the Accident Prevention Committee, presented a talk on Accident Prevention. In connection with this, statistics were presented showing the accident trend since 1923, as well as the kilowatt-hour output and the cost of construction in the industry. It was pointed out that this chart definitely showed that construction was not the major cause of accidents and that further reduction in accidents was clearly up to the design engineer and the operating engineer to eliminate all unsafe conditions and practices in the utility plant. It was also pointed out that accident prevention work, besides its humanitarian value, was of real economic value in reducing the cost of operation.

A symposium giving the experience of various companies in connection with the recent floods in New England and in Western Pennsylvania was presented under the auspices of the Operating and Maintenance Division. The experience of companies in attempting to maintain service as flood waters rose, and the value of interconnection between companies in different areas were clearly brought out. In addition, the steps taken by various companies to restore to serviceable condition equipment which had been flooded, were described. This equipment ranged from small meters and motors through the various sizes and types of transformers up to some of the largest generators on the systems. The steps to be taken to prevent a repetition of such disasters were discussed.

The System Engineering Division continued the symposium which had started at the last meeting on the reserve practices of various companies. Individual papers describing the reserve practice of the New York Edison System and the Cleveland Electric Illuminating System were presented. In the discussion of these papers the reasons for the varying practices of different companies were brought out.

The report on Principles and Practices in Grounding, which has been prepared by a Joint Subcommittee, was reviewed by the committee and approved, subject to written comments within thirty days.

The Apparatus and Design Division presented a symposium on Generator Station Bus Protection. The present and planned arrangement of bus protection in the following stations were described in detail:

Hudson Ave. Station.
Colfax.
Brunot Island.
Commonwealth Edison.
Richmond Station—Philadelphia.
Ashtabula.
Cahokia.
Detroit Edison.

These papers, in addition to describing the relay and switching arrangements used, also pointed out the barrier walls which were erected in switch houses and around certain types of equipment to prevent the spread of fire.

The Meter and Service Entrance Subcommittee reported progress in the development of the network meters in sizes comparable with the present single phase meters. In addition, progress is being made in the development and standardization of service entrance cable and the use of this cable for connection to the range.

A supplementary report on static condensers was presented. This report pointed out that in the present design of static condensers there is little margin of carrying capacity available for harmonic currents. In certain installations, considerable difficulty has been experienced due to the overheating of the condensers caused by harmonic currents of the power system, frequently accompanied by a local resonance condition. The report brings out some of the pre-

cautions which should be taken in any application of static condensers.

A report, giving the progress of the Joint Committee on the standardization of the engineering features of electric ranges was presented. Considerable progress has been made in determining the proper rating and voltage of elements for various services. In addition, considerable progress has been made in the electrical balance of ranges. The discussion developed the necessity for standardization in element size so as to simplify the problem of servicing ranges on an extensive system.

The committee enjoyed the privilege of attending a joint luncheon meeting with other committees, which was addressed by Mr. Alex Dow. Mr. Dow's address described briefly the fundamental features of the British Grid and gave some of his observations from personal inspection of the grid and his contact with its designers and operators.

Transmission and Distribution Committee Meeting

P. H. Chase, *Chairman*

THE tenth meeting of the Transmission and Distribution Committee was held at the Statler Hotel, Detroit, on May 12 and 13, during a Group Meeting of several other technical committees of the Institute. A majority of the Committee membership was present or represented. In addition several other power company engineers were present making a total registration of approximately 100.

This meeting was preceded, on the afternoon and evening of May 11, by a joint meeting of the Underground Group of the T. & D. Committee, the Insulated Power Cable Engineers Association and the High Tension Cable Committee of the Association of Edison Illuminating Companies. Several papers and discussions on cable problems were presented at this joint meeting which were summarized by C. T. Sinclair at the morning session of the T. & D. Committee on May 12. Also, at this session, W. F. Davidson summarized the recent progress made in high tension cable research and A. L. Malstrom of the Detroit Edison Company presented a summary and analysis of weather bureau records for wind velocity, temperature and glaze formation in the states of Michigan, Wisconsin, Illinois and Indiana. J. R. North of the Commonwealth and Southern Corporation gave an interesting paper on new types of line trucks. This was accompanied by an exhibit of several trucks, parked conveniently to the hotel for inspection, which had been loaned by the Consumers Power Company, The Detroit Edison Company and some of the truck manufacturing companies.

The afternoon session on May 12 was taken up by an account of the flood experience in Pittsburgh by E. W. Oesterreich of the Duquesne Light Company. Mr. Oesterreich's presentation was accompanied by numerous slides and photographs which gave a vivid picture of the extensive damage caused by the devastating flood conditions which the Pittsburgh district had recently passed through. D. C. Stewart of the Buffalo, Niagara and Eastern Power Corporation presented a paper that outlined a method his company had developed for melting glaze from transmission lines and for the prevention of ice on line conductors. This was followed by a paper, also presented by Mr. Stewart, on Jumping Conductors, and a motion picture film which showed this phenomenon. Papers were also presented at this session by C. L. Warwick, Secretary-Treasurer of the American Society for Testing Materials, on the Research Activities of the ASTM and by C. W. Meyer on the subject of The Common Galvanizing Process.

The forenoon session of May 13 was taken up by reports and progress reports on Pine Pole Treating Specifications by L. G. Smith, Pole Line Hardware by H. P. Seelye, Pin Insulator Specifications by W. H. Knutz and a discussion of the Dry Arcing and Leakage Characteristics of Pin Type Insulators by J. H. Foote.

The afternoon session was devoted to reports and discussions on subjects under the sponsorship of the Plant Coordination Group. This consisted of a report on the status of the Joint-use Specifications and discussions on Multi-grounded Rural Lines, Carrier Frequency Developments and Radio Interference.

Following the adjournment of the afternoon session, a joint meeting with representatives of other committees interested was held to discuss the needs of the industry for the use of short-wave radio and securing allocations of wave lengths suitable for this service. A wide interest was evidenced in the use of short-wave radio for power company purposes and it was decided to study the subject thoroughly in the near future. H. W. Eales was assigned sponsorship of this project.

An interesting feature of these Group Meetings was a luncheon held on May 12 at which Mr. Alex Dow, President of The Detroit Edison Company, was the speaker. All those attending the meeting were invited to attend this luncheon and a large number were present. Mr. Dow spoke in a very interesting manner on the engineering aspects of the British Grid.

"Higher Cost Due to the Grid"

" 'The working with the Central Electricity Board during the year exceeded the cost which we would have incurred had the Board never existed.'

"This remarkable statement was made by the Chairman of the County of London Electric Supply Co. Ltd., at the annual general meeting of the shareholders. It means that the establishment of the Grid has involved higher charges to the electricity supply company than would have been necessary were there no Grid.

"It is the opinion of a large number of electrical engineers, if it were possible to make an exact survey throughout the country, that it would be found the grandiose idea of the Grid has not, on the whole, cheapened electricity or made its use more widespread, but has had the reverse effect."

—*The Oil Engine* (London), April, 1936.

Missouri Association Convention

C. E. MICHEL, sales manager of the Union Electric Light & Power Co., St. Louis, Mo., was re-elected president of the Missouri Association of Public Utilities at the annual state convention of the association, held April 29, 30 and May 1 in St. Louis at Hotel Jefferson.

The other officers elected were: First vice-president, Ben C. Adams, Gas Service Co., Kansas City, Mo.; second vice-president, E. H. Lewis, St. Louis County Gas Co., Webster Groves, Mo.; third vice-president, Chester C. Smith, Kansas City Power & Light Co., Kansas City, Mo.; treasurer, Hermann Spoehrer, Union Electric Light & Power Co., St. Louis, Mo.; secretary, N. R. Beagle, Missouri Power & Light Co., Jefferson City, Mo.; managing director, E. A. Beer, Jefferson City, Mo.; assistant secretary, Jesse Blythe, Jefferson City, Mo.

The following executive committee was elected: E. P. Gosling, St. Louis, Mo.; L. W. Helmreich, Jefferson City, Mo.; T. J. Strickler, Kansas City, Mo.; D. W. Snyder, Jr., Jefferson City, Mo.; Fred Karr, St. Joseph, Mo.; O. F. Funk, St. Louis, Mo.; A. E. Bettis, Kansas City, Mo.; R. G. Taber, Cape Girardeau, Mo.

The association membership includes virtually every privately owned gas, electric and water utility in Missouri. A total of 237 delegates were registered, of which 68 were women.

The speakers on the program and their subjects were: "Through the Years in the Gas Industry," L. B. Denning, Dallas, Texas, president of the American Gas Association; "Electricity in the Olden Days—and Now," Alex Dow, Detroit, Mich., president, Detroit Edison Co.; "Welcome to St. Louis," E. P. Gosling, St. Louis, Mo., president, Laclede Gas Light Co.; "Rural Electrification in Missouri," D. W. Snyder, Jr., Jefferson City, Mo., president, Missouri Power & Light Co.; "Why Home Service Women?" Miss Frances Weedman, Chicago, Ill., General Electric Appliance Corp.; "A Few Remarks," Louis H. Egan, St. Louis, Mo., President, Union Electric Light & Power Co.; "Looking Backward to See Forward," Gardner S. Howland, Chicago, Ill., Commonwealth Edison Co.; "More Safety, Less Accidents," J. M. Strike, St. Joseph, Mo., St. Joseph Railway, Light, Heat & Power Co.; "Service," H. T. East, Chicago, Ill., Public Service Company of Northern Illinois.

An Employees' Speaking Contest was held on the evening of April 29. Employees of utilities throughout the state were eligible. Contestants in the State contest were chosen by company eliminations. Six contestants were men, and three were women. First prize in each class—men and women—was fifty dollars in cash. Second prize in each was twenty-five dollars.

The subjects were: For men, "The Utility's Part in the Development of the Community"; for women, "The American Home—How the Utilities Help Build It." The winners were: Women, first prize, Miss Dolores Milburn, Union Electric Light & Power Co., St. Louis, Mo.; second prize, Miss Lillian Butterfield, Central Distributing Co., Kansas City, Mo. Men, first, Vall G. Herber, Gas Service Co., Kansas City, Mo.; second, Fred M. Sholders, Kansas City Power & Light Co., Kansas City, Mo.

Fred H. Luecke, Warrensburg, Mo., president of the Missouri Public Service Co., presided at the Open Forum held on the evening of April 30. Three subjects were discussed by speakers, followed by questions from the floor. The subjects were: "Hazards to Water Supply Due to Faulty Plumbing," "Outdoor Metering," and "Rental or Trial Period Experience with Load-Building Appliances."

The time and place of holding the next annual convention will be selected by the executive committee at a meeting, probably in December.

Southeastern Electric Exchange Convention

THE annual Southeastern Electric Exchange Conference, held at Charleston, S. C., on April 30-May 1, attracted more than 300 delegates to what was designated as the best meeting yet held by the Exchange.

Officers elected for the coming administrative year were L. V. Sutton, president; W. E. Mitchell, G. C. Estill and J. A. Langley, vice-presidents.

In his presidential address J. G. Holtzclaw characterized the Exchange as an organization that is making excellent progress and contributing greatly to its members. President Holtzclaw also pointed out that utility men could repair storm and flood damage and overcome tangible problems and adversities, but they found it difficult to overcome the political enmity that strikes at the foundation stones of private enterprise. He urged unity in action and aggressive work to advance the industry.

Wendell L. Willkie, President, Commonwealth and Southern Corporation, New York, was the speaker of the evening at the annual banquet of the Exchange, held at the Fort Sumter Hotel, Charleston, May 1. In a ballroom packed with hundreds of men and women of the industry in the southeast, Mr. Willkie made a stirring address.

He pointed out the fallacies in the contention that Government or anyone else could come into the electrical field at this late date and match the pioneering or salesmanship of its men and women. He pointed to the outstanding progressive policies of the southern companies in voluntarily reducing rates over a long period of years and in sales plans that have enabled the homes and business of the south to set a pace for the rest of the country. Mr. Willkie paid high tribute to the courage of the electrical people and predicted that they would be triumphant over all the obstacles.

An interesting paper on the Georgia Home-Town Contest was presented by O. M. Jackson and discussed by W. T. Christie. In this program, sponsored by the Georgia Power Company, more than 80 per cent of the towns served have entered into a contest for cash prizes to be awarded on the largest use of electricity and the largest increment growth in energy use during the year. The cities are classified into groups of about the same population and the cash prizes are to be devoted to any civic or charitable purpose the town fathers decide. Remarkable interest has been shown, as evidenced by quotations from local newspapers quoted by Mr. Jackson. The contest has been of great promotional value, a direct sales asset and a new development in better public relations.

Selling the low-use customer was a topic presented by E. W. Ashmead. Em-

ployee selling, the use of home-service girls and the adoption and sale of low-priced appliances were urged as the best methods to use. Larger size of lamps, the use of the new I.E.S. floor and table lamps and low-priced irons, percolators and fans were found effective. In 1934 Tennessee Electric Power had 55 per cent of lamps 60 watts or larger, but in 1936 the percentage increased to 72. For 50 cents down and 50 cents a month some 20,000 I.E.S. table lamps were sold. Thirty thousand $1.95 irons were sold in two years. As a result of these efforts minimum bill customers have decreased from 19.3 per cent in 1934 to 8.4 per cent in 1936, despite taking on about 13,000 new customers in the last two years.

The utility industry is going ahead, according to a splendid paper presented by M. O. Troy. He gave an analysis of sales, sales prospects and the developments that the industry now faces in load. He urged that manufacturing facilities be used at the best possible load factor and that steps be now taken to meet future demands. He estimated current needs as $500,000,000 to provide adequate service for loads now dormant but awakening rapidly; $100,000,000 to serve new loads added in 1936; $350,000,000 for replacement—a total of $950,000,000.

Tarleton Collier of the Atlanta *Georgian* gave an analysis of the present business and political picture. He decried the creation of class hatreds and the adoption of spending policies that lead to destruction. He had a rather pessimistic outlook on the future of this country if present administrative policies are followed.

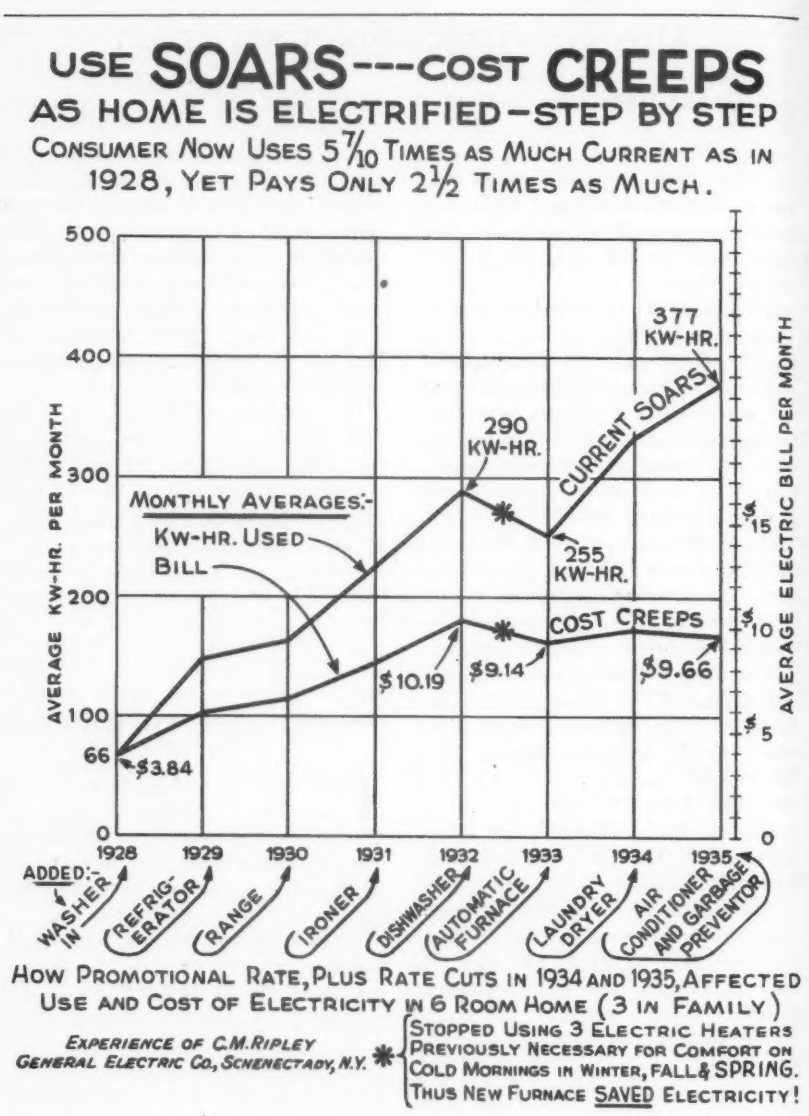
The electric kitchen as a load builder was advocated by George E. Whitwell. Essentially this is a creative idea to sell an assembly instead of separate items. It is modeled on the bathroom. The idea has sales promotion and business-getting value and should be used in some form in all areas. H. G. Isley gave a splendid paper on how dealers and utilities can aid each other in promoting appliance sales. H. C. Webb, Jr., outlined the current trends in power sales and advocated stronger support for the power sales department. Samuel G. Hibben gave an informative and illustrated talk on the expanding horizons of lighting.

Committee reports were given by the several standing committees: E. W. Ashmead on sales, E. S. Fitz on engineering and C. J. Curry on accounting. Much work is being done by each committee of great value to the member companies. Good examples were the pamphlet on distribution practices and the analysis and suggestions on the proposed classification of accounts of the Federal Power Commission.

A plea for more planning of distribution systems was presented by L. S. Smith. This part of the system represents a large part of the investment and needs careful planning to reduce costs and improve service.

Utilities should build rural lines and should do all they can to aid the farm cooperatives, said Graham Clayton in discussing rural electrification. He urged specialized rural salesmen to help farmers. He suggested the operation and maintenance of cooperatives by private utilities. A broad policy of aid, promotion and support of rural electrification is the one to adopt, in his opinion. This was supported by that of Prof. C. E. Seitz of V.P.I.

N. G. Symonds gave a splendid talk on selling the industry to the public. L. W. W. Morrow showed data that indicated the Southeastern area was building domestic business more rapidly than any other section, despite the fact that the rate was not the lowest and the economic and territorial conditions about the worst. That this program is good business was proved by the fact that this section had the highest average annual revenue per customer in 1935.



Devices for Reducing Harmonics on Power Systems

IT is generally recognized as commercially impracticable to build rotating a-c machinery whose voltage wave form is entirely free from harmonics. Furthermore, some distortion of wave form is inevitable in transformers which employ iron in their magnetic circuit. There are, therefore, harmonic voltage and current components present on all commercial a-c systems. While these harmonic components are usually unimportant from the standpoint of the operation of the power system, they are of interest from the standpoint of noise induction in neighboring telephone circuits.

As a result of care in the design of rotating machinery and transformers, it has been found possible generally to maintain these harmonic components at sufficiently low levels to permit satisfactory coordination with exposed telephone circuits by means of the usual methods, such as transpositions, etc., available to the operating power and telephone companies. In a limited number of cases involving unusually large harmonic components arising in rotating power system machinery, coordination by the ordinary methods has not been found practicable. In certain of these cases the best solution of the problem has been found to be the application in the power system of frequency selective devices consisting of combinations of capacitance and inductance, as a means of reducing the undesired harmonic components.

The development and increased application of the rectifier and similar vapor discharge devices have tended to complicate the wave shape problem, since the generation of harmonics of considerable magnitudes is inherent in the operation of apparatus of this character. While the magnitudes of the harmonics in the a-c supply to a rectifier depend considerably upon the type and size of the supply system, they can be controlled to only a very limited extent in the rectifier design. The increasing use of rectifiers has therefore tended to increase the number of cases in which selective devices applied in a-c systems as a means of reducing wave shape distortion and affording satisfactory inductive coordination have been found necessary. The various types of frequency selective devices considered in connection with these cases are described in Engineering Report No. 34*. Methods of designing and computing the effectiveness of a given type of selective device in a particular situation are discussed. Consideration is given in a general way to the mounting of the apparatus required, and methods are described for calculating the effects of selective devices on power factor and regulation. The theoretical treatment in the report is supported in most cases by test data obtained on actual installations in the field.

The following summarizes the present state of the art as regards the application of the various types of selective devices studied:

a. Resonant shunts used either individually or in combinations of two or more in parallel afford the most generally attractive type of selective device for reducing either slot harmonic components arising in synchronous machinery or the harmonic components occurring in the a-c supply circuit to a rectifier.

b. Under certain circumstances, limited amounts of series inductance and shunt capacitance may be used advantageously in combination with resonant shunts.

c. The usefulness of the low-pass filter, that is a combination of series inductance and shunt capacitance, appears to be limited to the a-c supply circuit to rectifiers supplying a relatively constant load.

d. In special rectifier applications combinations of series inductance and capacitance used in conjunction with resonant shunts or shunt capacitance, have certain merits. These series inductances and capacitances are tuned for resonance with the supply circuit at the fundamental frequency.

e. The use of series inductances or shunt capacitances alone of sufficient magnitudes to be effective in reducing harmonic components is practically precluded due to their adverse effects on regulation and power factor.

The devices referred to in items a and c are shown schematically in Figs. 1 and 2 respectively. One situation, where the arrangement of Fig. 1 was employed on the a-c side of a rectifier, is described in an article entitled "Cooperation Is Keynote in Rectifier Supply Coordination," which appeared in the August, 1935, issue of the BULLETIN.

*This report will be included in Volume 3 of Engineering Reports of the Joint Subcommittee on Development and Research which is now being printed. Individual copies of this report in mimeograph form are available at a price of $.80 for members of the Edison Electric Institute and $2.00 for non-members.

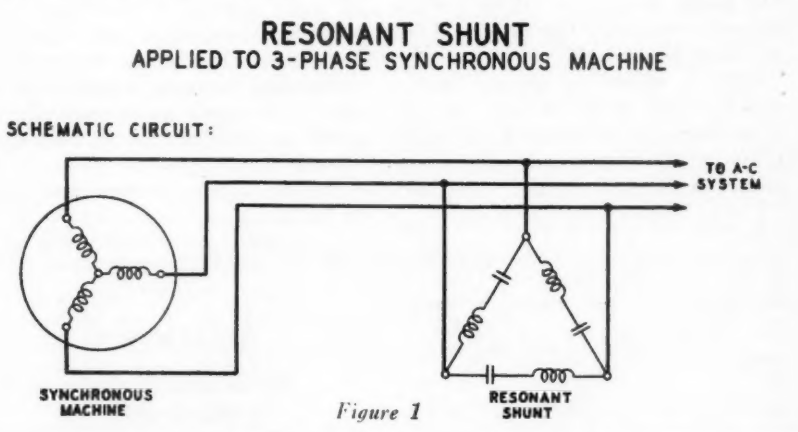


Figure 1

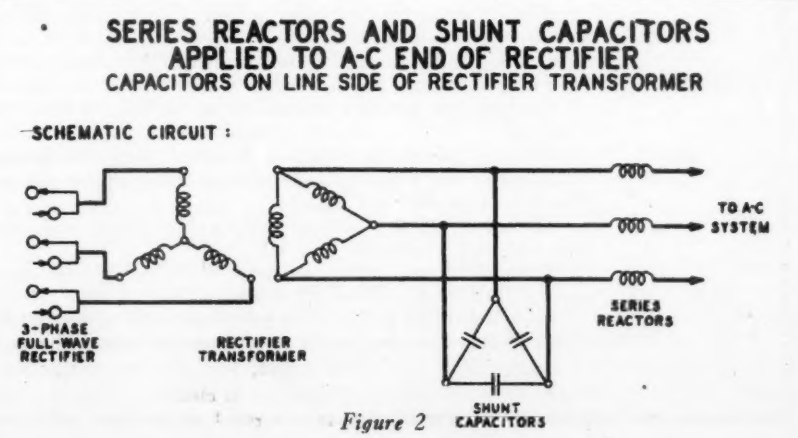


Figure 2

George Oxley

GEORGE OXLEY is dead. This is a fact and, as he used to say: "Facts are facts and you can't get away from them. You can refuse to face them, you may be able to dodge them for a while, you may try to twist them and for a time seem to be successful—but they will always come back to you as just plain facts."

But it is going to be difficult for some of us who knew him so well and worked with him day in and day out to get used to this fact—to accept it without trying to dodge it. For some time to come there will be that inclination to reach for the telephone, dial his number, and after listening to his cheery "how be yuh" suggest that as the sun has just gone over the yard arm it's about time, and so on and so forth.

There are thousands of public utility executives, near executives and just plain employees; newspaper men; men in public life and men trying to get into public life; advertising men and public relations specialists, scattered from one end of this country to the other, who knew him longer than I did. With a single exception none knew him better and but few knew him as well.

This is neither an obituary nor a eulogy. I am content to leave the first to the keeper of the morgue of any well-organized daily newspaper and the second to the lip service of those who, busy with their own affairs, may have forgotten him when he was no longer an outstanding figure in the electrical industry. It is just a memorandum for the record so that the file can be marked "closed."

GEORGE F. OXLEY
October 15, 1885—April 21, 1936

Perhaps his two greatest characteristics were his mental honesty and his loyalty regardless of whether or not that loyalty was returned in kind. A good soldier, he was often called upon to do things which were against his better judgment and against which he fought bitterly, but when the battle was over "orders were orders."

Never a "yes-man" himself, he had an inherent distrust of yes-men. He believed that the greatest disservice a publicity or public relations man could render his employer or his client was to agree with him verbally when he didn't agree with him mentally.

No one ever worked for George Oxley—one worked with him. When an employee started working for him and stopped working with him he neither worked for nor with him.

No friend in need, no matter how undeserving he might be, ever came to him and went away empty handed. Relatively speaking, he probably gave away more money than most of our well-known philanthropists.

Always a newspaper man in spite of his rise through a series of executive positions, he considered that failure to keep faith with a dead-line was the one unpardonable sin. Well, he has kept faith with his last dead-line and wherever he may be he has no problems of public relations to worry him.

—E. G.

SHADOWS

By George F. Oxley
April, 1921

Flitting across the landscape, hugging close to rock and tree and blossoms; deepening tints and colors, magically; softening harshness, or developing high-lights, now here, now there; furnishing for tender growths momentary coolness and surcease from the sometimes too amorous warmth of the sun, are—Shadows.

Shadows but enhance the charm of beauty. Without them, no picture can be complete.

Humans follow the rules of Nature. With all the ingredients save Shadows alone, man's life would be as tasteless as ashes, as flat and as barren of joy as Death Valley is of verdure and life.

Without Shadows, without care and problems and grief, ambition would lack incentive, life would cloy and kill.

With Shadows—facing setbacks, obstacles to overcome and disappointments—mankind strives to achieve all things.

Each individual is the artist who paints the picture of his own life. The use to which Shadows are put marks the difference between the masterpiece and mediocrity.

"Public Ownership of Utilities Gets Boost in Lavish Picture Book Published by WPA Workers of New York City"

From an article by T. W. Phelps in the Wall Street Journal of April 23

WORK relief funds are being used to further the administration's public ownership of utilities campaign in the public schools.

Taking a leaf from the Federal Trade Commission's 1934 report to the Senate accusing private utilities of overlooking no means of presenting the utility story to all schools—"even the kindergarten being provided with a specially published picture book," WPA workers in New York City have just gotten out a lavishly illustrated edition of "Building America, A Photographic Magazine of Modern Problems," devoted to "Power." Typical of the "non-partisan" presentation of the subject is the blunt assertion:

"In short, city-owned plants have brought lower electric rates and lower taxes."

Sample copies of the magazine have been sent to superintendents and teachers of schools throughout the country, according to the local office manager.

Accompanying the "Power" issue of the magazine is a folder entitled "Teachers guide for the 'Power' issue of Building America," giving four "general directions for teaching the 'power' issue," and 11 "specific suggestions for teaching." Among the topics listed under those 11 suggestions are such question-begging interrogations as:

"Should the Government build its own power plants, which will help to reduce the price of electricity to many consumers?"

No Rate Comparisons

The bibliography of "worth-while references" on the last page of the magazine does not include the comparisons of municipal and company rates recently issued by the Edison Electric Institute on the basis of the electric rate survey of the Federal Power Commission. The most interesting aspect of that Power Commission survey, according to William M. Carpenter, economist of the Edison Institute, "has been the confirmation of the fact that the privately operated utilities have, on the average, lower rates for electricity than the municipal plants."

Instead, the "Power" issue of "Building America" runs the whole gamut of public ownership campaign argument. . . .

"Cheap Power" Appears Frequently

The old TVA favorite, "cheap power," is sprinkled through the publication. It is just "power" when private companies produce it, but whenever it is produced by any governmental agency, it becomes "cheap power," no matter what it costs.

Repeated in the magazine is the now familiar TVA miracle of "Before" and "After," or "What a little electricity will do for lumbago." On the left-half page is a picture of an unshaven man, in overalls, an old woman, with spectacles, a brunette mother and two children, one of them also in overalls. That is before the coming of the TVA.

"After TVA came this family moved into one of the model workers' homes at Norris, Tenn., shown here," says the caption for the facing photograph. What a change! Father with his overalls and stubble of beard has been shooed out. Mother's hair is no longer straight and black, but is curly and blond. Little Willie's hair has been combed, and instead of overalls he has on a nice pair of shorts, and a short-sleeved shirt. He looks like a different boy. Maybe he is. His younger sister now looks older than he is, and they have a radio where grandmother used to be. As the magazine puts it, "Contrast this home with that shown on the opposite page."

Explanation Is Simple

The explanation is so simple any fourth-grader should get it in one reading. The TVA sells electric power to nearby towns. Consumers now pay only 2.5 cents a kilowatt hour "which is about half what the average American family pays. In this way, TVA, like municipal plants, applies a yardstick to the rates of private power companies."

Even Passamaquoddy gets a boost.

"For many years engineers have dreamed of harnessing the power of ocean tides. Now at last the United States Government has started to make this dream come true, in Passamaquoddy Bay, Maine," the editors say. Apparently the rebellion in Congress against harnessing the moon broke too late for this edition.

Economic planning is given a hand, too.

"All these benefits of our power age will come with cheap power and careful planning of industry for the whole country," the magazine says.

"Building America" is published with the assistance of the Lincoln School of Teachers College, Columbia University, and the Works Progress Administration, New York, Project Number 65-97-295, Sub-project 27," the magazine states on its back cover.

WPA Staffs Project

At the publication office, Room 334, Lincoln School, 425 West 123rd Street, New York City, it was stated that the entire project was staffed by the WPA and was under the general supervision of Dr. Peter Fishman, head of all the Columbia University WPA projects. The publisher, the cover further states, is the Society for Curriculum Study, which, it was explained, has a membership of more than 500 teachers, educators and professors in the United States and Honolulu. The publication is said to be non-profit making at present, though it has 6,000 annual subscribers, 2,500 subscribers for the spring term and 575 for the fall term, it was stated. Subscriptions are being taken at the rate of $1.50 for eight issues (the school year) or $1 a year if 10 or more subscriptions are for the same address.

Just a random of the thoroughness with which the country has been covered with "sample" copies which the statement at the publication office, in response to a query, that the head of the Rochester, Minn., high school had been sent a copy of the first issue, on "housing."

Rochester, Minn., has a population of roundly 20,000.

"WPA's 'Twig' Project"

An editorial in the New York World-Telegram of May 1

REMEMBER the "twig committees" of the private utility organization?

These committees, so called because of their slogan, "As the twig is bent the bough is inclined," were disclosed by the Federal Trade Commission to be busily engaged spreading propaganda in the school system. They distributed private utility propaganda pamphlets in

the schools, and even went so far as to revise textbooks and subsidize college professors to make sure that students were properly instructed as to the blessings of private utility ownership and the evils of public ownership.

Justifiable indignation followed these disclosures.

Now we find the federal government engaged in a barefaced twig-bending enterprise of its own. One of the New York WPA projects is a magazine called "Building America," published, so the masthead says, "with the assistance of the Lincoln School of Teachers' College, Columbia University," and sold at cost to schools for use as text material.

A recent issue devoted to power, although theoretically impartial, arrives at a net conclusion emphasizing the benefit of the Federal Holding Company law and the correctness of the studies made by the Federal Power Commission. And, sweepingly, the magazine says:

"The most effective device for reducing electric rates seems to be the development of yardsticks with which to measure the fairness of rates charged by these companies. Already nearly 2,000 cities have set up municipal plants, which, on the whole, have been able to supply current more cheaply than private companies."

It so happens that the point of view expressed here coincides with our own. But regardless of how much we personally may agree with the conclusion, we emphatically condemn the method of dissemination. The promulgation of one side of any public controversy as part of a school curriculum, at public expense or otherwise, is as indefensible when backed by federal sponsorship as when sponsored by utility magnates.

It is just as wrong for the WPA to misuse the taxpayers' money to propagandize in favor of public ownership as it is for the power companies to misuse the electric consumers' money to propagandize for private ownership.

Mr. Hopkins should step in at once and separate the few misguided twig-benders from the public payroll.

Professor Bonbright and Officers of New York Power Authority Okehs the Dummy, Says Editor

In a letter of protest against the foregoing editorial, addressed to the editor of the *World-Telegram*, and published in that paper, Dr. James E. Mendenhall, Editor of "Building America," wrote in part:

"The editorial board is the sole and final authority in formulating the editorial policy of Building America. The WPA workers are used in the capacity of researchists who gather, organize and check the materials used in various issues of our magazine. Thus, when you say the federal government is engaged in disseminating information favoring public ownership through Building America, you are misstating the truth of the case. The federal government has absolutely nothing to do with the formulation of our editorial policy.

"I would furthermore like to state that the material presented in our 'Power' issue was carefully read by leading power authorities of the country. Such men as Professor James C. Bonbright of Columbia University, and several officers of the Power Authority of the State of New York examined the 'dummy' of the 'Power' issue before its publication. We have their testimony to the high educational value of the issue and to the fairness of the presentation of the case. . .

"Classroom teachers and leading educators throughout the United States have expressed enthusiastic approval of "Building America." They feel that it deserves the support of all progressive-minded men and women in the country."

WPA Propaganda

From an editorial in the Indianapolis, Ind., News of April 27

THE use of WPA funds to prepare pamphlets, motion pictures and exhibits defending the WPA plan of relief has been generally criticised as an unwarranted use of the people's money for a partisan political purpose. But the boondogglers are not moved to desist. Instead, they have embarked in a new propaganda venture of extraordinary effrontery. They are publishing a magazine called "Building America," which is devoted in part to persuading the people that the TVA and similar socialistic power projects are just what the country needs to put it on its feet. . . .

The federal trade commission feared that the schools were being misused in the campaign and that the people's money was being taken from them without good reason or a fair return. Will the same commission now order Hopkins and his boondogglers to quit spending the people's money on a scheme to convert school children to socialistic state notions? Probably it will remain silent. It will see that the real purpose is to make the people pay for propaganda that will refute opposition charges that TVA is wasteful and visionary, and probably will decide that its own safety calls for seeing nothing and hearing nothing.

Indianapolis, Ind., *News*,
April 27, 1936.

Prime Movers Committee Meeting, May 11 and 12

P. W. Thompson, Chairman

THE metallurgical problems introduced by the use of high temperatures and pressures and the alloys which have been developed for these uses were extensively discussed. A case was reported where some seamless tubing made of 18-8 stainless steel stabilized with Columbium recently ruptured under pressure. Microphotographs showed that the chromium had precipitated at the grain boundaries, as chromium carbide, accompanied by a large increase in grain size. It was stated that there is a tendency for the 18-8 alloys to become brittle after use, the chromium migrating to the grain boundaries and making the metal brittle. Attempts have been made to solve the problem by the introduction of Columbium or titanium to stabilize the chromium.

In a recent superheater built for 850 degrees the KA_2S end of the superheater tubes failed at small cracks which the manufacturer now thinks were present when the tubes were formed. It was brought out in the discussion that actual measurements have shown that 850 degrees steam temperatures result in 1200 degrees metal temperatures and therefore that 925 degrees operating steam temperatures would probably mean 1300 degrees metal temperatures.

Concerning the general question as to what can today be regarded as the limiting operating temperature it was stated that one manufacturer is willing to build turbines for 1000 degrees Fahrenheit service. A member expressed the opinion, based on about five years' operating experience with a turbine and superheater at 1000 degrees, that anyone building such a plant would have less trouble with the turbine than with the superheater. Suitable metal for high temperature superheaters was emphasized as an important first problem for the Chemists Subcommittee to investigate.

Discussing the question of slag in dry bottom furnaces and the minimum practicable ash fusion temperature it was reported that 1900 degree fusion ash had been successfully handled in a dry bottom furnace, the ash remaining solid.

Favorable reports were rendered on the metal spraying equipment to build up clearances, protect turbine casings against water cutting, etc. It was re-

(*Continued on page* 196)

POWER SALES ITEMS

AIR CONDITIONING

"New Uses for the Psychrometric Chart in Simplifying Air Conditioning Problems," by W. Goodman. *Heating, Piping and Air Conditioning,* March, 1936, p. 147. Keeney Publishing Company, Publishers, 6 North Michigan Avenue, Chicago, Ill.

Method in determining the required state of the air supply to meet given room conditions.

"Savings Pay Operating Cost of Air Conditioning System," by A. J. Rummel. *Heating, Piping and Air Conditioning,* April, 1936, p. 209. Keeney Publishing Company, Publishers, 6 North Michigan Avenue, Chicago, Ill.

This article goes on to state the reduction in employee absences and the value of air conditioning from an economic standpoint; also describes the control of the system with the multiple compressors and develops some ideas which may be incorporated to advantage in air conditioning systems.

BUILDINGS

"No Windows and Why," by L. K. Urquhart. *Factory Management & Maintenance,* March, 1936, p. 114. McGraw-Hill Publishing Company, Inc., Publishers, 330 West 42nd Street, New York City.

The Hershey office and printing plant at Hershey, Pa. Details of building construction, controlled lighting, and air conditioning.

DIESEL ENGINES

"Corning, Iowa, Municipal Plant Starts Operation," by C. Maxwell Stanley, Young & Stanley, Inc. *Diesel Power,* March, 1936, p. 146. Diesel Publications, Inc., 192 Lexington Avenue, New York City, Publishers.

A description of the principal equipment of the Diesel engine plant, together with one month's test results and the history of litigation which preceded the installation.

"Cushing Municipal Power Plant," by Joseph L. Ingram, Plant Superintendent. *Diesel Power,* March, 1936, p. 153. Diesel Publications, Inc., Publishers, 192 Lexington Avenue, New York City.

PWA Diesel engine plant project which is architecturally attractive. Principal equipment is described.

"It's Thrifty to Pump with Diesel Power," by C. A. Brown, Burlington, N. C., Pumping Station. *Diesel Power,* March, 1936, p. 158. Diesel Publications, Inc., Publishers, 192 Lexington Avenue, New York City.

Installation of a 100 hp. Diesel which saves $1,755 net each year in the cost of pumping. Operating records for two years up to October, 1934 are given.

"State Taxes on Diesel Fuel," by L. H. Morrison, Editor, *Diesel Power,* April, 1936, p. 241. Diesel Publications, Inc., Publishers, 192 Lexington Avenue, New York City.

Complete survey of Diesel fuel oil taxes in each State in the Union.

"Oil Engine Electric Generating Station Operating Costs," by G. C. Eaton. *Power Plant Engineering,* April, 1936, p. 223. Technical Publishing Company, Publishers, 53 West Jackson Blvd., Chicago, Ill.

Operating economies that may be expected of oil engine electric generating plants up to 30,000 br. hp., presented to the ASME.

DREDGING

"Dredging With Central Station Power," by C. R. Reid. *Electrical News and Engineering,* April 1, 1936, p. 25. Hugh C. MacLean Publications, Ltd., Publishers, 347 Adelaide Street West, Toronto, Canada.

Economical transmission of power obtained by using 15,000 volt submarine cable between land and lake substation.

ELECTRIC FURNACES

"Electric Furnaces to Bright Anneal High Carbon Stock," by Willard Roth, Westinghouse Electric & Manufacturing Co. *Metal Progress,* January, 1936, p. 35. American Society for Steel Treating, Publishers, 7016 Euclid Avenue, Cleveland, Ohio.

The author points out the advantages of the use of controlled atmospheres in electric furnaces for preventing oxidation and decarburization while annealing high carbon steel and includes cost data, heating cycles and chemical analyses of before and after annealing conditions of the carbon content of the material.

"Kelsey-Hayes Melts Iron and Steel in Brackelsberg Units," by Frank J. Oliver. *Iron Age,* April 9, 1936, p. 46. Iron Age Publishing Company, 239 West 39th Street, New York City, Publishers.

A general description of the iron melting facilities at this plant, including 5 Brackelsberg units and one 6-ton electric arc furnace, is given. The description, however, is somewhat misleading as it states that steel is regularly melted in the Brackelsberg units whereas other reliable sources indicate that only gray iron and special malleable irons are melted. The attained temperatures stated in the article are also much higher than can be used in practice without serious deterioration of the linings.

ELECTRIC HEATING

"Selling Industrial Electrical Heating," by J. F. Thomlinson. *Electrical News and Engineering,* March 1, 1936, p. 27. Hugh C. MacLean Publications, Ltd., Publishers, 347 Adelaide Street West, Toronto, Canada.

METALS

"Quenched Steel—Why Is It So Hard?" by Francis B. Foley. *Metal Progress,* March 1936, p. 52. American Society for Steel Treating, Publishers, 7016 Euclid Avenue, Cleveland, Ohio.

An account, in language not too scientific, of the development of the present theories concerning this most important metallurgical mystery. The power sales engineer interested in the promotion of electric heat for metallurgical purposes will find the material contained in this article a useful addition to his trade knowledge.

"Continuous Carburizing of Screws With City Gas," by John A. Comstock. *Metal Progress,* April, 1936, p. 44. American Society for Steel Treating, Publishers, 7016 Euclid Avenue, Cleveland, Ohio.

This article gives useful information on heating and carburizing by means of a competitive fuel.

"Age-Hardening Alloys and Their Applications," by Dr. R. H. Harrington. *General Electric Review,* March, 1936, pp. 124-127. General Electric Company, Publishers, 1 River Road, Schenectady, New York.

The term "age-hardening" has broadened to include those reactions that are more efficiently developed by the use of other than room temperatures. In this article the author discusses characteristics of process—types of age-hardening—methods of research and some examples of technically useful age-hardening alloys.

MUNICIPAL PLANTS

"Municipal Electric Service," by Wallace A. Rogers. *Electrical World,* March 28, 1936, p. 44. McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York City, Publishers.

Excess generating capacity, low fuel economy, inadequate line maintenance, insufficient line capacity found in Iowa plants.

PUBLIC RELATIONS

"Father and Son. Seven Steps to Trouble or Happiness. Size No Excuse for Clumsy Performance. Simplify Organization and Be Natural," by Richard E. Smith. *Electrical World,* April 11, 1936, p. 1024. McGraw-Hill Publishing Company, Inc., Publishers, 330 West 42nd Street, New York City.

Some straight talk on public relations by an experienced observer can be put to use by the utility industry.

RAILROAD ELECTRIFICATION

"The Pennsylvania Railroad Electrification: New York-Washington," by W. D. Bearce. *General Electric Review,* March, 1936, pp. 139-145. General Electric Company, Publishers, 1 River Road Schenectady, New York.

This is the second and last part of this article and discusses the types of locomotives, protective and auxiliary circuits, and multiple unit cars, together with station and repair facilities.

RECTIFIERS

"Mercury-Arc Rectifiers in Industrial Service," by H. R. Behr. *Electric Journal,* March, 1936, p. 151. Electric Journal, Publishers, 530 Fernando Street, Pittsburgh, Pa.

Comparison of operating economies of conversion apparatus.

Prime Movers Committee

(*Continued from page* 194)

ported that successful metallizing on metal blasted parts had been procured where such metallizing on sand blasted parts had failed. The magnetic dust testing of turbine blades was favorably discussed.

An extensive discussion of current superimposition projects was had, including descriptions of the installations being made in the Logal Station of the American Gas and Electric Company, the Waterside Station of the New York Edison Company, and briefly at the Fisk Street Station of the Commonwealth Edison Company.

Safety valves have been found not to relieve as much steam as their rating. It was the sense of the committee that safety valve manufacturers should be required to certify to tests of their different sizes and designs of valves as those pressures for which they are offered for sale. This view of the Prime Movers Committee will be communicated to the Boiler Code Committee.

Final reports of the Boiler Subcommittee, Combustion Subcommittee, Turbine Subcommittee and Chemists Subcommittee were submitted, commented on and referred to the Editing Committee for editing and publication.

Professor A. G. Christie gave advance notice of papers proposed for the Niagara Falls meeting of the American Society of Mechanical Engineers in September. Those now planned for presentation are as follows:

A. G. Christie—Current Practice and Trends
E. H. Krieg—Superposition
J. A. Powell—Design for 500 lb to 800 lb with Medium Sized Units
Dr. Otto Schoene—German Boiler and Turbine Practice
Dr. Schute—Furnace Design and Construction
English contributions not yet determined
There will be discussions by several foreign engineers.

Mr. Harold Farmer of the Philadelphia Electric Company has been appointed to be representative of the Electric Light and Power Group on the ASA Sectional Committee for Petroleum Products under the sponsorship of ASTM. Mr. Farmer expects to clear his activities through the Chemists Subcommittee of the Prime Movers Committee. Any Prime Movers Committee matters relating to lubricants and fuel oils may be conveyed to Mr. Farmer through the Chemists Subcommittee.

CONVENTIONS AND MEETINGS

MAY

1 Southeastern Electric Exchange, Fort Sumter Hotel, Charleston, S. C.
1 Missouri Association of Public Utilities, St. Louis, Mo.
4-9 National Electrical Wholesalers, Hot Springs, Va.
10-11 Hydraulic Power Committee, Statler Hotel, Detroit, Mich.
10-11 Accident Prevention Committee, Statler Hotel, Detroit, Mich.
11-12 Prime Movers Committee, Statler Hotel, Detroit, Mich.
11-12 Electrical Equipment Committee, Statler Hotel, Detroit, Mich.
11-14 National Fire Protection Association, Atlantic City, N. J.
12-13 Transmission and Distribution Committee, Statler Hotel, Detroit, Mich.
17-22 National Electrical Manufacturers Association, Hot Springs, Va.
25-28 National Association of Purchasing Agents, Inc., Roosevelt Hotel, New Orleans, La.
28 National Board of Fire Underwriters, Waldorf-Astoria Hotel, New York, N. Y.

JUNE

1-4 EDISON ELECTRIC INSTITUTE, Opera House, Municipal Auditorium, St. Louis, Mo.
8-9 North Central Electric Association, Nicollett Hotel, Minneapolis, Minn.
17-20 The American Society of Mechanical Engineers, Dallas, Texas.
22-25 National Association of Cost Accountants, Netherland Plaza Hotel, Cincinnati, Ohio.
22-26 American Institute of Electrical Engineers, Pasadena, Cal.
24-26 Canadian Electrical Association, Manoir Richelieu, Murray Bay, Quebec, Can.
29-30 American Society for Testing Materials, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J.

JULY

1 American Society for Testing Materials, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J.

AUGUST

31 Illuminating Engineering Society, Statler Hotel, Buffalo, N. Y.

SEPTEMBER

1-3 Illuminating Engineering Society, Statler Hotel, Buffalo, N. Y.
7-12 Third World Power Conference, Washington, D. C.

OCTOBER

26-30 American Gas Association, Atlantic City, N. J.

NOVEMBER

30 American Society of Mechanical Engineers, New York, N. Y.

DECEMBER

1-4 American Society of Mechanical Engineers, New York, N. Y.

Case Against MVA Bill

(*Continued from page* 171)

and include such great projects as Muscle Shoals—already owned by the government—and the Mississippi, Columbia and Colorado rivers. . . ."

". . . . we must take the utilities away from the private interests . . . ."

The TVA Act seemed to be the first step in the above quoted general plan and the Mississippi Valley Authority Act seems to be the next step in the same general program.

American Standards for Rotating Electrical Machinery

NEW and revised requirements for most of the rotating electrical machinery manufactured and used in the United States are now made available in a single volume, the *American Standards for Rotating Electrical Machinery*, just published by the American Standards Association.

Standard requirements and specifications for electrical machinery, from the large central station generators and industrial and steel-mill motors to the small motors used on household appliances, such as vacuum cleaners and electric fans, are included in the new publication. Direct-current, synchronous, and induction machines, synchronous converters, and a-c and d-c fractional horsepower motors are covered.

With new material added by the American Standards Association's committee, the publication combines revisions of the material formerly published by the American Institute of Electrical Engineers in five separate pamphlets (A.I.E.E. 5, 7, 8, 9, 10) and those motor and generator standards of the National Electrical Manufacturers Association which are of general interest.